APPENDIX K

Preliminary Assessment of the Dredge Material Management Plan

MISSISSIPPI RIVER SHIP CHANNEL
GULF OF MEXICO TO BATON ROUGE, LA
Dredged Material Management Plan Preliminary Assessment
Summary of Findings and Recommendations
November 2017

1 EXECUTIVE SUMMARY

Sound management of maintenance dredged material is an important part of the U.S. Army Corps of Engineers (USACE) navigation mission. As part of this mission, a dredged material management plan (DMMP) must be kept current for all Federally maintained navigation projects as required by USACE policy, Engineering Regulation 1105-2-100, 3-2, b(8) and E-15. The goal is to accomplish disposal of dredged material from navigation projects in the least costly manner and meet all Federal environmental standards.

The DMMP process may include one or both of two phases. The first phase, the Preliminary Assessment (PA), is conducted at a limited scope. The PA must identify sufficient capacity for dredged material disposal for a minimum of 20 years; it must document the continued economic viability of the project by achievement of a benefit to cost ratio (BCR) that exceeds unity; and it must ensure that ongoing operations and maintenance (O&M) activities are consistent with all environmental compliance documents. If the outcome of the PA shows deficiencies in any of these areas, the second phase to initiate a more detailed dredged material management study must then be performed.

This PA addresses the Mississippi River Ship Channel (MRSC) Gulf to Baton Rouge, LA Deep Draft Navigation Project. It covers the project as currently constructed and maintained, as well as the proposed deepening to 50 ft that is recommended in the on-going general reevaluation study and report *Mississippi River Ship Channel Gulf to Baton Rouge, La Integrated General Reevaluation Report and Supplemental Environmental Impact Statement* (GRR/SEIS). The intent of the PA is to identify if the dredging and disposal practices are sufficient for the current project for the next 20 years, and to ensure the proposed deepening to 50 ft does not result in the need to change these practices. This will allow the PA to cover both project depths for the next 20 years.

The PA identifies sufficient capacity to dispose of the expected dredged material for the next 20 years, for both the current project depth and the proposed 50 ft project depth. The PA identifies that the channel, as currently maintained, is economically justified, and the GRR/SEIS provides the economic justification for the proposed 50 ft project depth. Finally, the PA determines that the project is in environmental compliance. Therefore, further DMMP development, in the form of a DMMP study, is not needed at this time. This level of assessment satisfies USACE requirements through Fiscal Year (FY) 2038. Should conditions in the river change prior to this

time, the PA DMMP should be reevaluated, to determine if it is still adequate for the changed conditions, or if further analysis is warranted.

2 SCOPE

This PA covers the dredging and disposal methods for the Mississippi River Ship Channel Gulf to Baton Rouge, LA Project (sometimes referred to as Mississippi River Ship Channel Baton Rouge to Gulf, LA Project). This project includes dredging and disposal of the deep draft navigation channel that extends from the Gulf of Mexico beginning at River Mile (RM) 22 Below Head of Passes (BHP), and extends through the Port of Baton Rouge, LA, ending at RM 233.8 Above Head of Passes (AHP), (to include the reach identified as Southwest Pass (SWP) which extends from RM 0 at the Head of Passes (HoP) to RM 22 BHP, and the SWP Bar Channel which extends from RM 19.5 BHP to RM 22 BHP), the approach channel to the New Orleans Harbor from RM 104.5 to RM 86.7 AHP, and the reach identified as South Pass (SP).

3 PROJECT LOCATION AND DESCRIPTION

The MRSC is a deep draft navigation channel, providing deep draft navigation access to ports located along the Mississippi River in Southeast Louisiana. The project area begins near Baton Rouge, LA, at RM 233.8 AHP and extends to the Gulf of Mexico, ending at RM 22 BHP (Figure 1). The channel services four of the top 13 ports in the United States: the Port of Greater Baton Rouge (Port of Baton Rouge), the Port of South Louisiana, the Port of New Orleans, and the Plaquemines Port, Harbor and Terminal District (Port of Plaquemines), the reach also includes the Port of St. Bernard. The Port of South Louisiana is the largest port in the nation in terms of tonnage. Routine maintenance dredging of the channel includes the MRSC, an approach channel to the New Orleans Harbor, and the reach identified as SP.

MRSC Project Location

Table 1 provides a summary of key projects features including the authorized, constructed, and maintained channel dimensions, as well as the proposed changes in dimension recommended under the GRR/SEIS.

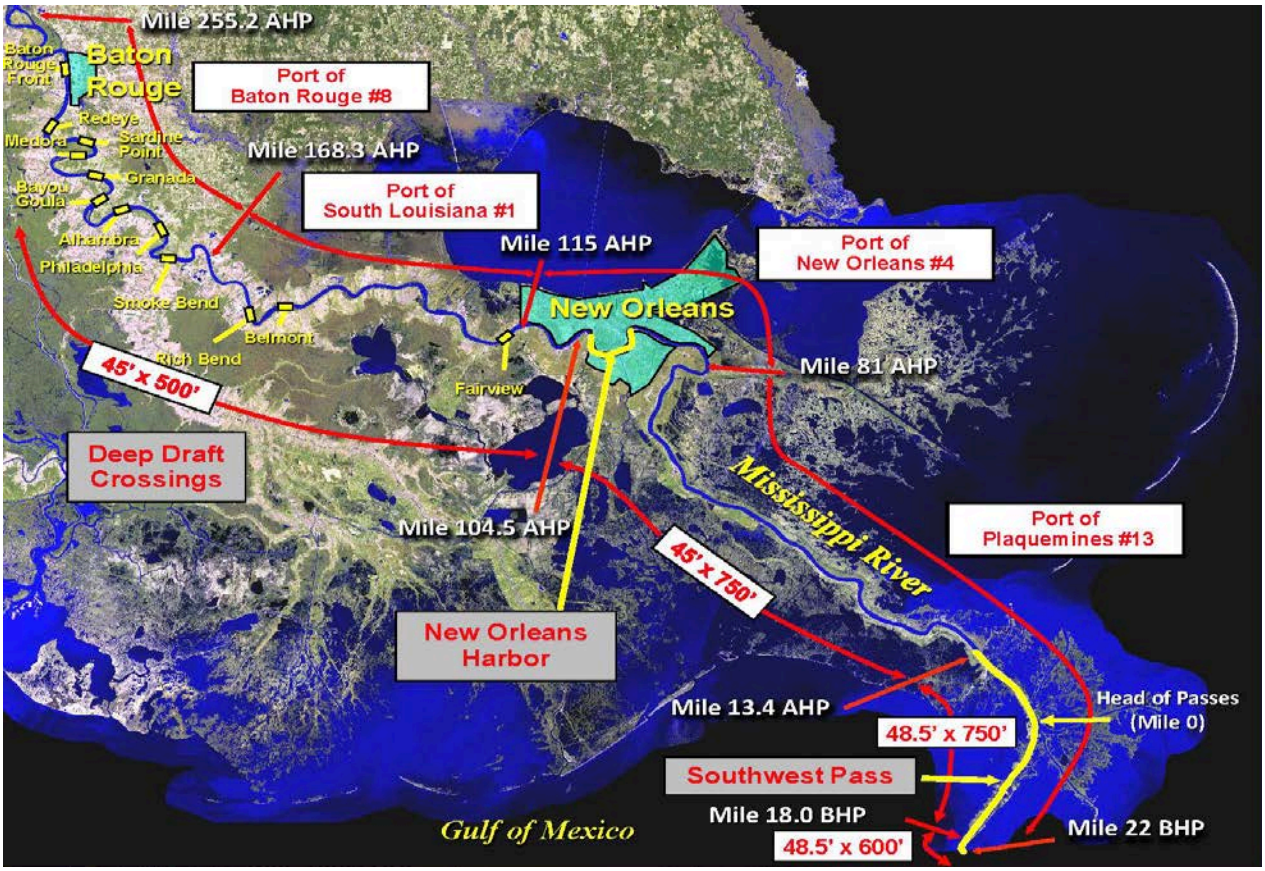

Figure 1 MRSC Project Location

Table 1 Summary of Project Features

Dredging Reach	Authorized	Maintained	Proposed Changes in construction and maintenance depth from GRR/SEIS[1]
RM 233.8 AHP to RM 232.4 AHP[2]	55 ft depth x 500 ft width	40 ft depth x 500 ft width	None
RM 232.4 AHP to RM 104.5 AHP[3]	55 ft depth x 500 ft width	45 ft depth x 500 ft width	50 ft depth
RM 104.5 AHP to RM 0 HoP[4]	55 ft depth x 1000 ft width	45 ft depth x 750 ft width	50 ft depth
RM 0 HoP to 17.5 BHP	55 ft depth x 800 ft width	45 ft depth x 750 ft width	50 ft depth
RM 17.5 BHP to RM 22.0 BHP	55 ft depth x 600 ft width	45 ft depth x 600 ft width	50 ft depth
Approach Channel to the New Orleans Harbor[5]	40' depth x 500' width	15 ft to 35 ft depth x width (varies based on natural contour)	None
South Pass	30 ft depth x 450 ft width	17 ft depth x 300 ft width	None
South Pass Bar Channel	30 ft depth x 600ft width	17 ft depth x 300 ft width	None

[1] The GRR/SEIS proposes changes to the currently constructed and maintained depths only, it does not propose widening of the channel, nor does it propose changes to the authorized dimensions. The fully authorized dimensions may be implemented in future construction phases.
[2] A turning basin 55 ft deep by 500 feet wide was authorized in this reach, but was not constructed.
[3] Most of this reach is naturally deep and wide and does not require maintenance dredging; however, there are 12 regularly dredged deep draft crossings that will require routine maintenance dredging.
[4] The main navigation channel in this reach is naturally deep and wide and does not require construction or routine maintenance dredging. Dredging within the main navigation channel in this reach only occurs from approxately RM 11 AHP to RM 0 at HoP.
[5] The approach channel project authorization was amended by WRDA 1986 to authorize a change in the dimensions of the existing approach channel to a depth of 40 ft beginning 200 ft from the face of the wharves on the left descending bank. This feature has not been constructed, and the approach channel is maintained to its pre-WRDA 86 authorized project dimensions, in accordance with the authorization in the River and Harbors Act (RHA) of 1938 to a depth of 35 ft beginning 100 ft from the face of the wharves.

The reference datum for project depth varies by reach. The SWP and SP are tidally influenced. SWP is referenced to the Mean Lower Low Water (MLLW). The Reach within the portion of the project that lies above the Port of New Orleans is maintained to the Lower Water Reference Plane (LWRP). The transition between reference datums MLLW and LWRP, occurs in the vicinity of New Orleans, where tidal influence in the river ceases.

USACE Engineering Circular (EC 1110-2-6070), titled "Engineering and Design, Comprehensive Evaluation of Project Datums" dated 1 July 2009, provided guidance that all districts perform an assessment called the Comprehensive Evaluation of Project Datums (CEPD) to ensure projects are referenced to the proper nationally recognized vertical datum. Subsequently, a memorandum from the Director of Civil Works dated 24 October 2014, Subject: "Navigation Projects Compliance with Vertical Datum Guidance," stated:

> For federal navigation, projects where the MLLW depth differs from the depths stated in the project authorization, an Engineering Documentation Report (EDR) shall be prepared in accordance with reference 1.d [ER 1110-2-1150], paragraph 8.3 for each project and posted on a navigation home page for each district. The EDR will be of limited scope to document the datum change only.

EDR-OD-01 "MLG to MLLW Vertical Datum Conversion Mississippi River Venice, Louisiana to the Gulf of Mexico (Vicinity of Southwest Pass)" dated 01 May 2017, provides the datum change from MLG to MLLW for RM 13.4 AHP to RM 22 BHP. An EDR that addresses the MRSC above RM 13.4 AHP to the vicinity of New Orleans and SP,may be prepared at a future date. Currently the New Orleans Harbor Project Area is maintained to MLG and a conversion to LWRP is provided.

For the MRSC, extending from RM 233.8 AHP to RM 22 BHP, construction to the authorized depth of 55 ft is being implemented in phases. Construction of Phase I was completed in December of 1987 and provided -45 ft Mean Low Gulf (MLG) from Donaldsonville, LA, (RM 181.0) to the Gulf of Mexico. Construction of Phase II, completed in December 1994, involved deepening of the MRSC to -45 ft LWRP between Donaldsonville, LA, (RM 181.0) to Baton Rouge, LA (RM 232.4 AHP), and included dredging river crossings to an equivalent depth. Although the Report of the Chief of Engineers dated April 1983 (1983 Chief's Report), recommended deepening to a depth of 55 ft through RM 233.8 AHP the project was not fully implemented above RM 232.4. RM 233.8 to RM 232.4 is maintained to 40 ft.

In a prior decision document for the project, it was determined that Phase III would implement the fully authorized project. However the current on-going GRR/SEIS for the MRSC recommends deepening to 50 ft under Phase III, with future construction phases to implement the fully

authorized project as determined to be appropriate, based upon conditions and needs that are present at the time of future project re-evaluations.

4 PROJECT AUTHORITY

The following provides a summary of pertinent project authority and decision documents.

The River and Harbor Act of 1925: The project, "Mississippi River, Louisiana between Baton Rouge and New Orleans," described in the report of the Chief of Engineers published as House Document No. 105, Sixty-Ninth Congress was authorized by the River and Harbor Act of 1925. The act provided for a 35 ft by 300 ft channel in the river below Baton Rouge, Louisiana.

The River and Harbor Act of 1938: This Act authorized the project entitled "Mississippi River at and Near New Orleans, Louisiana," as described in the report of the Chief of Engineers, published as House Document No 597, 75th Congress. The Act provided for a 35 ft by 1000 ft channel between the lower limits of the Port of New Orleans and Head of Passes on the Mississippi River; a 35 ft by 1,500 ft channel through the Port of New Orleans; and a 35 ft by 500 ft channel between Baton Rouge and New Orleans.

The River and Harbor Act of 2 March 1945, 76th Congress, 1st Session: This Act authorized the Mississippi River Baton Rouge to the Gulf of Mexico, Louisiana project. The act provided for the construction of a -35 ft LWRP by 500 ft channel between Baton Rouge and New Orleans; a -35 ft MLG by 1,500 ft channel within the Port of New Orleans; a -40 ft MLG by 1,000 ft channel from the lower limits of the Port of New Orleans to Head of Passes; a -40 ft MLG by 800 ft wide channel in Southwest Pass (SWP); a -40 ft MLG by 600 ft channel in Southwest Pass Lower Jetty and Bar Channel; a -30 ft MLG by 450 ft channel in (SP); and a -30 ft MLG by 500 ft channel in South Pass Bar Channel.

The River and Harbor Act of 1962, Public Law 87-874: This Act authorized the channel from Baton Rouge to the upper limits of the Port of New Orleans to a depth of 40 ft and construction of a 40 ft by 500 ft channel within the existing 35 ft by 1,500 ft channel within the limits of the Port of New Orleans and through the upper limit of the project located at RM 233.0 AHP.

The 1985 Supplemental Appropriations Act: This Act authorized the project for construction as follows:

> "…the Secretary of the Army acting through the Chief of Engineers is authorized and directed to proceed with planning, design, engineering, and construction of the following projects substantially in accordance with the individual report describing such project as reflected in the Joint Explanatory Statement of the Committee of Conference accompanying the Conference Report for H.R. 2577…Mississippi River

> Ship Channel, Gulf to Baton Rouge, Louisiana…*Provided further*, that the funds appropriated herein shall lapse on June 30, 1986, if the agreement required herein for that project has not been executed..."

As recommended in the 1983 Chief's Report and as authorized in the 1985 Act, no provision was made for the required cost sharing of the project.

The Water Resources and Development Act of 1986 (PL 99-662): Section 101 specified the cost sharing attributable to the construction, operation, maintenance, repair, replacement and rehabilitation (OMRR&R) of general navigation projects such as the MSRC.

Cost Sharing Construction:

> "Payments During Construction: The non-Federal interests for a navigation project for a harbor or inland harbor, or any separable element thereof, on which a contract for physical construction has not been awarded before the date of enactment of this Act shall pay, during the period of construction of the project the following costs associated with general navigation features…(c) 50 percent of the cost of construction of the portion of the project which has a depth in excess of 45 ft."

Cost Sharing of Operation and Maintenance:

> "The Federal share of the cost of operation and maintenance of each navigation project for a harbor or inland harbor constructed pursuant to this Act shall be 100 percent, except that in the case of deep-draft harbor, the non-Federal interest shall be responsible for an amount equal to 50 percent of the excess of the cost of the operation and maintenance of such project over the cost which the Secretary determines would be incurred for operation and maintenance of such project if such project had a depth of 45 ft."

Although the Department of the Army did timely execute an Agreement for Local Cooperation with the State of Louisiana on June 30, 1986 for Phase I (Depth enhancement of 45 ft to RM 181) of the Mississippi River Ship Channel Project From Baton Rouge, Louisiana to the Gulf of Mexico, Congress re-authorized the project in Section 201(a) of WRDA 1986.

Section 201(a) of the Water Resources Development Act of 1986 provided reauthorization of the project as:

Section 201_-- Harbor Development, Deep Draft Harbor Projects, Authorization for Construction:

> "(a) The following projects for harbors are authorized to be prosecuted by the Secretary substantially in accordance with the plans and subject to the conditions recommended in

> the respective reports designated in this subsection, except as otherwise provided in this subsection:…
>
> Mississippi River Ship Channel, Gulf to Baton Rouge, Louisiana. The project for navigation, Mississippi River Ship Channel, Gulf to Baton Rouge, Louisiana: Report of the Chief of Engineers, dated April 9, 1983, at a total cost of $471,000,000 with an estimated first Federal cost of $178,000,000 and an estimated first non-Federal cost of $293,000,000."

Section 2102(b) of the Water Resource Reform and Development Act of 2014, Public Law 113-121: This Public Law amended the cost sharing requirements of Section 101(b)(1) of WRDA 1985 by increasing the depth at which operation and maintenance of a navigation project requires a non-Federal cost share from 45 ft to 50 ft.

Section 1111 of the Water Resource Development Act of 2016, Public Law 113-121: This Public Law further amends Section 101(a) of WRDA 1986 to change the cost sharing for the construction of navigation projects for harbors or inland harbors, or separable elements thereof, for which a contract for physical construction has not been awarded before June 10, 2014. For such projects, or separable elements, the non-federal sponsor is required to provide during construction:

> a) 10 percent of the cost of construction of the portion of the project which has a depth not in excess of 20 ft; plus
>
> b) 25 percent of the cost of construction of the portion of the project which has a depth in excess of 20 ft but not in excess of 50 ft; plus
>
> c) 50 percent of the cost of construction of the portion of the project which has a depth in excess of 50 ft.

Pursuant to the implementation guidance for Section 1111, it has been determined that the construction of Phase 3 of the MRSC constitutes a separable element of the MRSC, such that the amended cost sharing provisions of Section 1111 apply to the Phase 3 construction of the project.

5 PERTINENT PREVIOUS STUDIES AND REPORTS

This is not a comprehensive list of all studies and reports related to the MRSC, this provides a summary of decision documents that support operations and maintenance dredging of the MRSC as described in this PA DMMP.

Letter from the Chief of Engineers "Mississippi River at and New Orleans, La" dated 19 April 1938 (1938 Chief's Report):This report described among other things dredging within the Port of New Orleans, a channel depth of 35 ft and maximum width of 1,500 ft measured from a line generally 100 ft from the face of wharves on the left descending bank, but not closer than 100 feet to the wharves on the right descending bank.

Letter from the Chief of Engineers "Mouth of the Mississippi River, La" dated 15 March 1939 (1939 Chief's Report authorized under the 1945 RHA):This report described among other things a recommendation that the existing projects for the Mississippi River, Baton Rouge to New Orleans; Mississippi River, South Pass; and Mississippi River, Southwest Pass be modified and combined and a project covering Mississippi River from New Orleans to the Head of Passes be added to provide a single project, Mississippi River, Baton Rouge to the Gulf of Mexico with the following channel dimensions:

- Baton Rouge to New Orleans, 35 feet deep (mean low Gulf) by 500 feet wide.
- Port limits of New Orleans, 35 feet deep (mean low Gulf) by 1,500 feet wide.
- New Orleans to Head of Passes, 40 feet deep (mean low Gulf) by 1,000 feet wide
- Southwest Pass, 40 feet deep (mean low Gulf) by 800 feet wide.
- Southwest Pass Bar Channel, 40 feet deep (mean low Gulf) by 600 feet wide.
- South Pass, 30 feet deep (mean low Gulf) by 450 feet wide.
- South Pass Bar Channel, 30 feet deep (mean low Gulf) by 600 feet wide.

Letter from the Chief of Engineers "Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana" dated 17 July 1961 (1961 Chief's Report):This report described among other things to provide a channel 40 feet deep and 500 feet wide from 0.1 mile below the Louisiana Highway Commission Bridge at Baton Rouge to the upper limits of the Port of New Orleans, and also (within the main navigation channel) 40 feet deep and 500 feet wide within the presently authorized (approach channel) 35 ft by 1,500 ft channel in the port limits.

The Feasibility Report titled <u>Deep-Draft Access to the Ports of New Orleans and Baton Rouge, Louisiana,</u> dated July 1981 (1981 Feasibility Report): This feasibility report re-evaluated the existing Mississippi River navigation channel between Baton Rouge, Louisiana and the Gulf of Mexico. The report recommended deepening the Mississippi River navigation channel to a 55 ft depth from Baton Rouge to the Gulf of Mexico, with the exception of that portion of the project within South Pass (which was previously authorized to a depth of 30 ft) and within the authorized approach channel for the Port of New Orleans which was recommended and is authorized to a depth of 40 ft (as distinguished from the authorized main navigation channel within the vicinity of the Port of New Orleans which was recommended in the 1981 Feasibility Report, and subsequently authorized, to be constructed to a 55 ft depth) .

The Report of the Chief of Engineers, titled <u>Mississippi River Ship Channel, Gulf to Baton Rouge, Louisiana</u>, dated April 9, 1983 (1983 Chief's Report) substantially approved the recommendations of the 1981 Feasibility Report, and the findings, conclusions and recommendations of the Board of Engineers, dated April 1, 1982, which identified the following key features of the project:

- "Enlargement of the existing channel in Southwest Pass from the Head of Passes (mile 0) to deepwater in the Gulf of Mexico at about mile 22 Below Head of Passes (BHP) to a project depth of 55 feet and a bottom width of 750 feet;
- Enlargement of the existing channel in the Mississippi River from the Head of Passes (mile 0) to within the Port of Baton Rouge (mile 233.0 AHP) to a project depth of 55 feet and bottom width of 750 feet;
- A turning basin with a project depth of 55 ft, a bottom width of 1,600 feet, and length of 4,000 feet, at the end of the enlarged channel in Baton Rouge (mile 233.0 AHP to 233.8 AHP); (this turning basin has not been constructed and the reach between RM 233.0 AHP to RM 233.8 AHP is maintained to a depth of 40 ft and width of 500 ft as described in the 1961 Chief's Report).
- Enlargement of the existing 35-foot channel along the left bank of the Mississippi River at New Orleans (mile 86.7 AHP to 104.5 AHP) to a project depth of 40 feet at the existing 1,500-ft bottom width (this feature of the project was not implemented and the approach channel to the New Orleans Harbor is maintained to a depth of 35 ft beginning 100 ft from the face of the wharves as described in the 1938 Chief's Report);
- River training works in South Pass and Pass a Loutre;
- Creation of about 11,600 acres of wetlands and 11,400 acres of upland habitat through overbank disposal of dredged material in the vicinity of Southwest Pass; and
- Freshwater reservoirs at East Point a la Hache and West Point a la Hache to mitigate for increased saltwater intrusion."

Mississippi River Ship Channel Gulf to Baton Rouge General Design Memorandum and Supplements (in chronological order of completion):

Design Memorandum No. 1 August 1983: This Design Memorandum recommended the following modifications for implementation of the project as recommended in the 1983 Chief's report:

(1) The enlargement of the existing Southwest Pass Bar Channel from a depth of 40 ft over a bottom width of 600 ft from RM 17.8 BHP to the Gulf;

(2) The enlargement of the existing 40 ft channel in the SWP from RM 0 at HoP to RM 17.8 BHP to a project depth of 55 ft over a bottom width of 750 ft; The enlargement of the 40 ft channel from RM 0 at HoP and RM 233.0 to a project depth of 55 ft over a bottom width of 750 ft;

(3) The enlargement of 12 wharf areas of the Mississippi River in New Orleans Harbor between RM 86.7 AHP to RM 104.5 AHP from a depth of 35 ft to a depth of 40 ft

(4) The construction of a submarine sill at RM 64.1 AHP and raw-water storage reservoirs for the East and West Pointe-a-la-Hache treatment plants and the Boothville treatment plant to mitigate for the increased saltwater intrusion.

Design Memorandum No. 1 Supplement No. 1 August 1986 (approved by Mississippi Valley Division Commander on 16 October 1987): This first supplement to the GDM recommended construction of a 45 ft deep channel from Venice, La through New Orleans Harbor up to RM 181 and the enlargement of berthing areas at 12 wharves of the Mississippi River in the New Orleans Harbor between RM 86.7 AHP to RM 104.5 AHP from a 35 depth to a 40 ft depth.

Design Memorandum No. 1 Supplement No. 4 December 1986 (approved by Mississippi Valley Division Commander on 22 December 1986): This supplement concluded that construction of training works in Pass a Loutre and South Pass as part of the project to deepen SWP to 45 ft was not warranted; and that further investigation regarding the need and justification for training works in these reaches should be deferred.

Design Memorandum No. 1 Supplement No. 6 May 1990 (approved by the USACE Director of Civil Works on 07 December 1990): This supplement addressed mitigation of increased salt water intrusion below RM 64 AHP caused by the 45 ft channel and recommended a change in the previously recommended saltwater intrusion mitigation plan from a reservoir plan to a plan to upgrade the existing water treatment and distribution system in Plaquemines Parish, to be constructed by the local sponsor.

Design Memorandum No. 1 Supplement No. 2 December 1992: This supplement covered Phase 2 of construction of the MRSC for the construction of a 45 ft deep by 500 ft wide channel from RM 181 AHP to RM 232.4 AHP. It showed that Phase II was incrementally justified and provided design for dredging 7 crossings to the project dimensions and implementation of training works in 4 of the seven crossings.

The following provides a summary of remaining DM Supplements which were planned but not completed.

Design Memorandum No. 1 Supplement No. 3: This supplement was intended to address implementation of training works from RM 181 to RM 232.4, this was incorporated and addressed in Supplement No. 2.

Design Memorandum No. 1 Supplement No. 5: This supplement was to consider widening of the Jetty Reach in Southwest Pass, but as of the 1990 Supplement No. 6 was identified as "Deferred" and has since not been completed.

As of completion of DM No. 1 Supplement No. 2, and the completion of construction of Phase 2 in 1992, the turning basin as described in the 1983 Chief's Report as 55 ft deep by 4,000 ft long located between RM 233.0 and 233.8 AHP was not constructed. Construction to a depth of 45 ft ended at RM 232.4 AHP, the upstream limit of the crossing identified as Baton Rouge Front. The reach of the project located between RM 232.4 and 233.8 is maintained to a depth 40 ft.

In a letter dated 18 June 1987 from the USACE New Orleans District (CEMVN) District Engineer to the Board of Commissioners of the Port of New Orleans, the District Engineer concurred with a request from the Port of New Orleans to continue maintenance of the approach channel in the New Orleans Harbor Area to a depth of 35 ft beginning 100 ft from the face of the wharves as authorized in the 1938 Chief's Report. The District Engineer concluded that benefits from the deepening of the channel would be realized irrespective of the larger berthing areas, as described in the 1983 Chief's Report being implemented. To date the approach channel is maintained by CEMVN to a depth between 15 ft and 35 ft beginning 100 ft from the face of the wharves, as described in the 1938 Chief's Report.

The New Orleans Port Authority is authorized by permit to perform maintenance dredging to remove silt accumulations beginning at the face of the wharves and extending to the corresponding natural river contour. The Port is authorized to dredge this reach to depths of -15 ft to -47 ft NGVD (the depth varies by location). Material dredged is deposited in deeper portions of the river, beyond the -55 ft contour.

Mississippi River, Baton Rouge to the Gulf of Mexico, LA Dredge Material Management Plan Preliminary Assessment 1995 provides dredging and disposal practices for deep-draft navigation to the ports along the lower Mississippi River, including the ports of South Louisiana, Baton Rouge, New Orleans, and Plaquemines. The maintenance practices as described in the document were the practices used at that time. It was recommended at that time to continue those maintenance practices for the next 20 years. The maintenance practices used now have changed and are described in the maintenance dredging section that follows.

The Mississippi River Ship Channel Gulf to Baton Rouge Project Integrated General Reevaluation Report and Supplemental Environmental Impact Statement was initiated in April 2015, and, as of preparation of this PA, is scheduled for completion in FY 2018. The GRR/SEIS examined whether navigation improvements to deepen the existing Federal project from the current depth of 45 ft to a depth of 50 ft for the MRSC are warranted and in the Federal interest. The GRR/SEIS considers deepening for those portions of the MRSC which were authorized to a depth of 55 ft in the 1985 Act. The approach channel to the New Orleans Harbor and SP were not included in the 55 ft project authority, and were therefore not considered in the GRR/SEIS. The GRR/SEIS recommends deepening the MRSC to provide deep draft access for navigation vessels to a depth of 50 ft from the Gulf of Mexico beginning at RM 22 BHP through the Port of Baton Rouge ending at RM 232.4 AHP. This would be accomplished by deepening the reaches identified as the deep draft crossings and SWP (as described in Section 7.1) from the current depths to a depth of 50 ft.

The 1981 Feasibility Study, the 1983 Chief's Report, and the GRR/SEIS are available at the following website: http://www.mvn.usace.army.mil/About/Mississippi-River-Ship-Channel/ .

6 PROJECT SPONSOR

The Louisiana Department of Transportation and Development (LaDOTD) is the Non-Federal Sponsor (NFS) for the project as authorized under the Supplemental Appropriations Act of 1985 and WRDA 1986, under the terms of the cost sharing agreements that were executed for the project pursuant to the Supplemental Appropriations Act of 1985 and WRDA 1986. For portions of the project which were authorized prior to the Supplemental Appropriations Act of 1985 and WRDA 1986, there is no non-Federal Sponsor.

7 MAINTENANCE DREDGING

The following describes the current dredging and disposal practices and is considered the base plan for this PA. The current dredging and disposal practices are within the Federal Standard and are considered the least cost options for the current project.

Engineering Regulation 1105-2-100 states the following in terms of the Federal Standard for dredged material. "Construction and maintenance dredging of Federal navigation projects shall be accomplished in the least costly manner possible." The "least costly" aspect of the MRSC Federal Standard disposal plan provides limits for O&M funding expenditures such that the only Beneficial Use (BU) disposal alternatives that are utilized for channel maintenance purposes are those whose costs do not exceed the costs of other non-beneficial use disposal alternatives that meet the "sound engineering practices" and "federal environmental requirements" criteria. The maintenance dredging and disposal practices described for the MRSC by reach are considered to be the Federal Standard.

7.1 Project Reaches

In order to provide information on the most recent maintenance dredging activities, the project was divided into four reaches: the deep-draft crossings from Baton Rouge to New Orleans, the New Orleans Harbor area, New Orleans to Gulf of Mexico, and SP.

7.1.1 Baton Rouge to New Orleans (Deep Draft Crossings)

The first reach extends from RM 233.8 AHP to 115 AHP (Figure 2). It includes: a portion of the jurisdictional limits of the Port of Baton Rouge which extends from RM 255.2 AHP to RM 168.3 AHP (RM 255.2 to 233.8 AHP is shallow draft navigation and is not part of the MRSC deep draft navigation project); and the jurisdictional limits of the Port of South Louisiana from RM 168.3 AHP to RM 115 AHP. Within this reach, the project is authorized to a depth of 55 ft and width of 500 ft. From RM 233.8 to 232.4 AHP the channel is maintained to a depth of -40 ft LWRP by 500 ft wide. Beginning at RM 232.4 AHP to RM 115 AHP the channel is maintained to a depth of -45 ft LWRP by 500 ft wide. There are numerous crossings (locations where the channel crosses the river between bendways) within this reach, 12 of which require regular maintenance dredging to provide the 45 ft depth and will need to be maintened to provide the propsed 50 ft draft. Of these 12 crossings, nine crossings (Smoke Bend, Philadelphia, Alhambra, Bayou Goula, Granada, Medora, Sardine Point, Red Eye, and Baton Rouge Front) are within the footprint of the Port of Baton Rouge, and three crossings (Fairview, Belmont, and Rich Bend) lie within the footprint of the Port of South Louisiana. Fairview and Rich Bend require maintenance dredging on less than an annual basis; the other 10 crossings are dredged annually. The other areas in between the 12 routinely maintained crossings are considered naturally deep and do not require maintenance dredging.

Dredging in the 12 deep draft crossings allows for 3 ft of advanced maintenance dredging, and an additional 2 ft of allowable over depth. Advanced maintenance is performed to avoid frequent re-dredging and to ensure the least overall cost of maintaining the project by allowing post-dredging shoaling to occur without impacting project depth. Allowable overdepth will account for inaccuracies in the dredging process, as well as shoaling during construction and maintenance dredging events, and facilitate obtaining the full advanced maintenance prism. Dustpan dredges are primarily used at the crossings, but hopper dredges have also been used when additional dredging capacity is required. Maintenance dredging is performed at least annually with an average of approximately 22.4 million cubic yards of material being removed from within this reach over the period from FY 2007 through 2016.

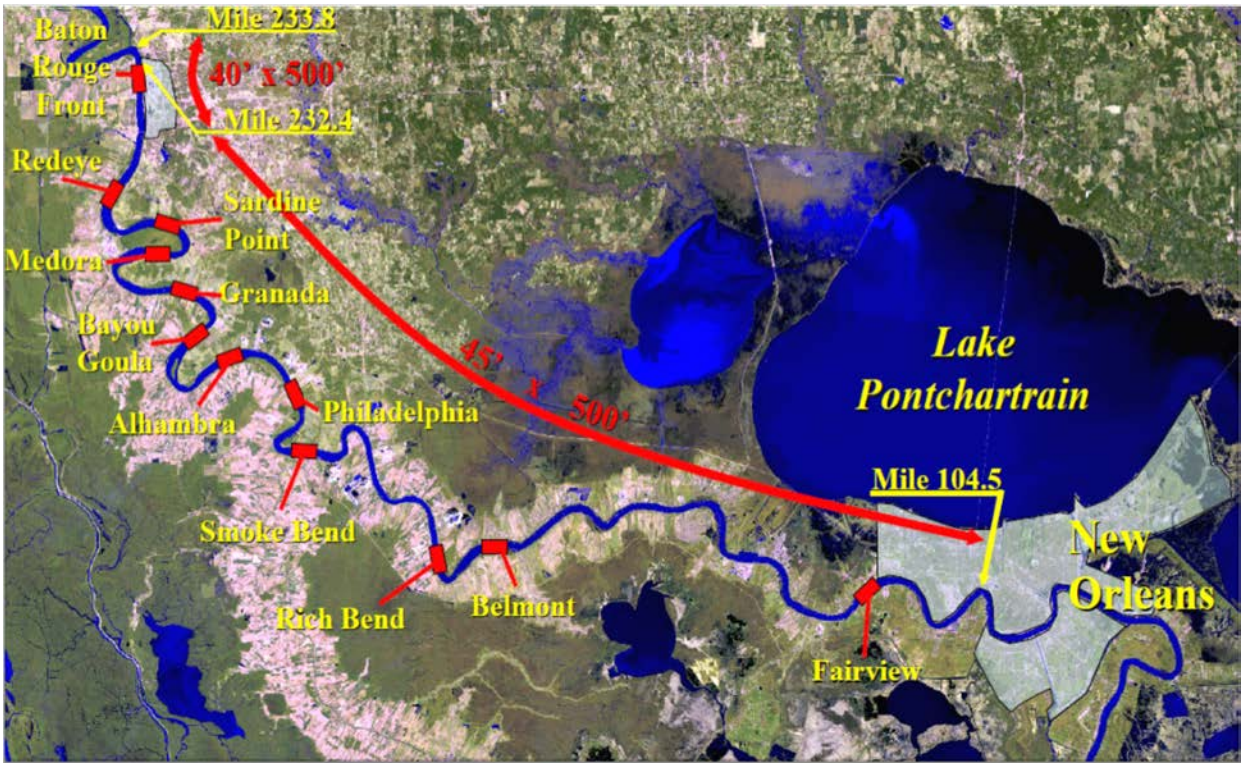

Figure 2 Regularly Maintained Deep Draft Crossings

7.1.2 The New Orleans Harbor Area

This reach extends from RM 115 AHP to RM 81.2 AHP and lies within the jurisdictional limits of the Port of New Orleans. Within this reach there are two components of the authorized project: (1) the main navigation channel of the MRSC; and (2) the approach channel to the New Orleans Harbor Area, located between RM 104.5 AHP to RM 94.6 AHP. In this reach the main navigation channel of the MRSC is authorized to a depth of 55 ft and width of 750 ft. It is considered naturally deep, and does not require maintenance dredging to provide deep draft navigation access. The approach channel under WRDA 1986 is authorized to a depth of 40 ft beginning 200 ft from the face of the wharves, but this project feature was not implemented and is maintained to a depth between -15 ft and -35 ft MLG (a conversion from MLG to LWRP is provided by reach in dredging contracts) beginning 100 ft from the face of the wharves, as authorized in the 1938 RHA (Figure 3).

A cutterhead dredge is utilized to dredge starting at a line 100 ft from the face of the wharves (of the New Orleans Harbor) on the left descending bank and extending toward the river's center to the corresponding natural contour of the Mississippi River to a depth between -15 and -35 MLG (the depth varies by location). Dredged material is discharged unconfined into the Mississippi

River beyond the natural contour depth of -55 ft MLG (Figure 3). Between 2007 and 2016, an average of approximately 800,000 cubic yards per year (cy/yr) of material were removed from this reach, under O&M dredging of the MRSC.

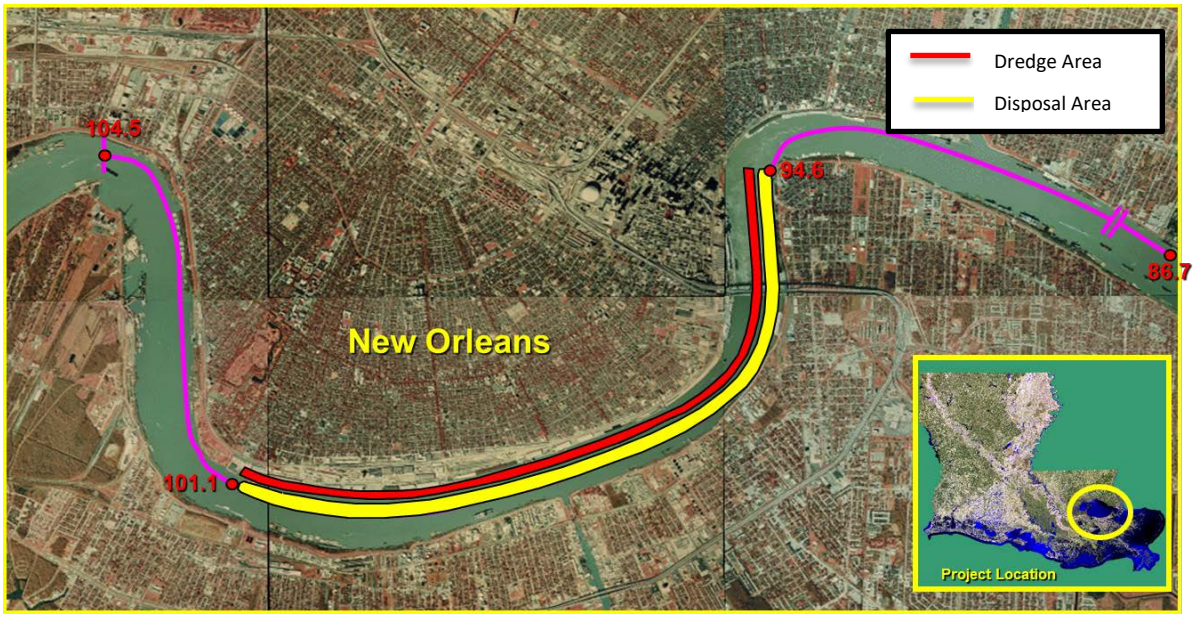

Figure 3 New Orleans Harbor

7.1.3 New Orleans to the Gulf of Mexico (including Southwest Pass)

The next reach extends from RM 81.2 AHP to RM 22 BHP. It includes the jursdicitional limits of the Port of St. Bernard and the Port of Plaquimines. From RM 81.2 AHP to RM 11 AHP the MRSC is authorized to a depth of 55 ft and a width of 750 ft but is naturally deep and does not require maintenance dredging to provide deep draft navigation access. The reach referred to as SWP, begins at RM 0 at HoP and extends to the Gulf of Mexico ending at RM 22 BHP, it includes the reach referred to as the Southwest Pass Bar Channel which extends from RM 19.5 BHP to the end of the project reach in the Gulf of Mexico at RM 22 BHP. (Figure 4). Refer to Table 1 for authorized and maintained dimensions between RM 81.2 AHP to RM 22 BHP. Maintenance dredging from RM 11 AHP to RM 22 BHP is to a depth of -48.5 ft MLLW. RM 13.4 AHP to RM 11 AHP is surveyed as part of this reach but does not require maintenance dredging. Per CEMVD-PD-OD Memorandum dated 19 January 2016 "SUBJECT: Advanced Maintenance for Dredging Mississippi River, Approximate Mile 12 Above Head of Passes (AHP) to 22 Below Head of Passes (BHP)," this reach is approved for 6 ft of advanced maintenance dredging, and an additional 2 ft is allowed for overdepth. The on-going GRR/SEIS, proposes deepening RM 11 AHP to RM 22 BHP to -50 ft MLLW.

Maintenance dredging in this reach involves the use of both hopper dredges and cutterhead dredges. Hopper dredges provide the mobility required to move quickly between multiple locations as shoaling conditions change along the 33 miles of navigation channel that typically comprise this reach. SWP hopper dredging efforts can be divided into two reaches: RM 11.0 AHP to RM 11 BHP and RM 11 BHP to RM 22 BHP.

From RM 11 AHP to RM 22 BHP, cutterhead dredges are typically used between RM 4.0 AHP to RM 18.8 BHP. Cutterhead dredges, because of their spudding systems, swing anchors, cables, and discharge pipelines, are considered navigation safety hazards in some channel reaches due to their inability to move quickly out of the channel if an oncoming vessel should lose steering control. For this reason, cutterhead dredges are restricted in their use in the Head of Passes area (RM 1 AHP to RM 1 BHP) and in the jetties and bar channel (below RM 18.8 BHP). While cutterhead dredges are used beginning at RM 18.8 AHP upstream, and hopper dredges are used drownstream, the transition point between the types of dredges used may change over time.

The three reaches as described above are dredged annually to maintain deep draft navigation. The portions of the MRSC from RM 11 AHP to RM 115 AHP, and in between the crossings, from RM 115 AHP to RM 232.4 AHP historically have depths in excess of 55 ft. Evaluation indicates this will remain the case through the 20 years considered under this PA for the current project depth and the p. In the present condition these reaches do not require construction or O&M to provide deep draft access. However, it is the intent that should existing conditions change in these reaches, the district would exercise its authority to conduct O&M action to maintain the constructed depth and width. An environmental analysis of the project may be required in that event.

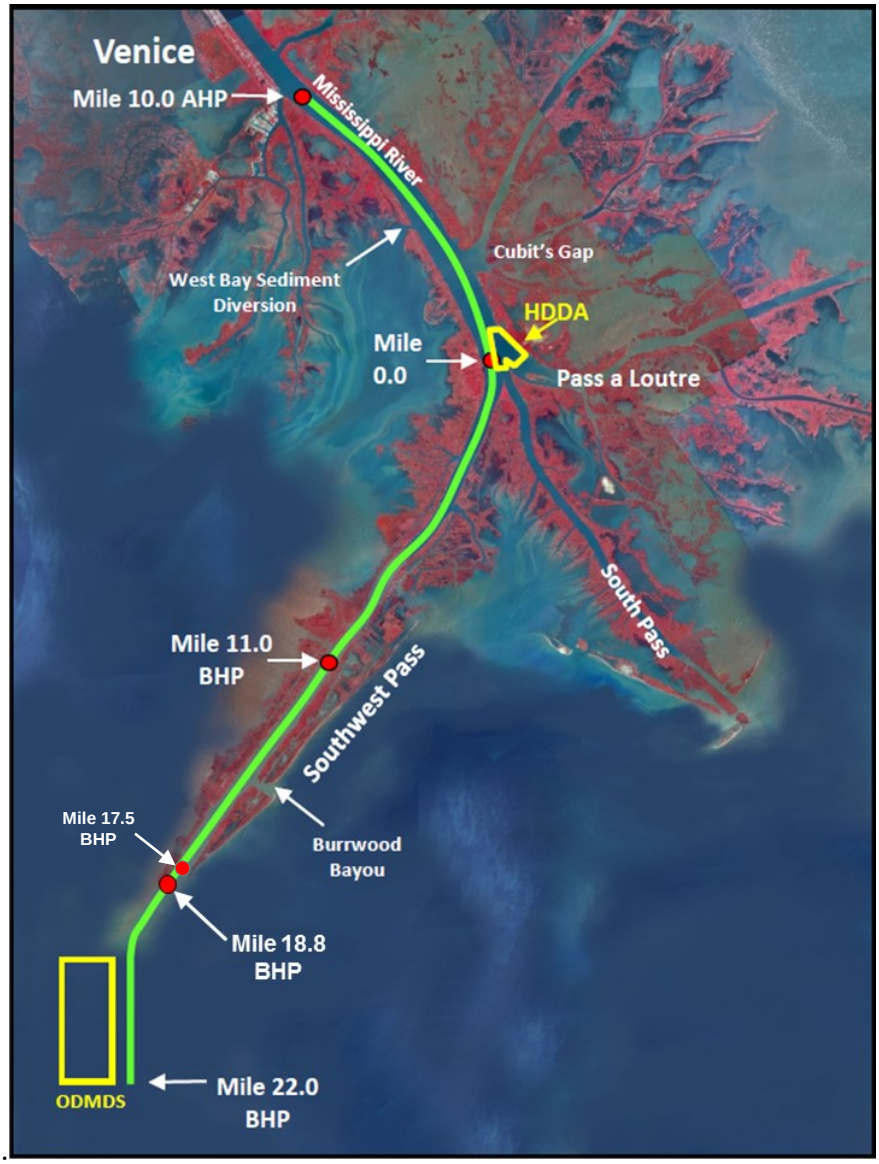

Figure 4 Southwest Pass Reach[1]

7.1.4 South Pass

Maintenance dredging of SP has only been performed twice since 1977, once from July 1999 through June 2000 and once from September 2006 through January 2007. An average of approximately 5.4 million cubic yards were dredged for each dredging event. Annual O&M funding for the Mississippi River navigation channel project has been insufficient to permit maintenance dredging of the SP navigation channel since 2007. Therefore, no predictions can be made regarding future maintenance dredging efforts for the SP navigation channel. Prior to 1977,

[1] Mile 17.5 BHP is the point at which the authorized and maintained project width changes. Mile 18.8 BHP is the point at which different dredges are utilized

maintenance dredging was conducted on an intermittent basis with between 1.0 and 3.0 million cubic yards being removed during every maintenance event.

A document titled "Mississippi River Baton Rouge to the Gulf Mexico, La. Condition of Improvement" dated 30 September 1995 stated "In keeping with Corps of Engineers policy that projects only be maintained consistent with reasonable needs of existing commerce, the channel through South Pass will be maintained to provide a depth of -17.0 feet Mean Low Gulf (M.L.G.) and a width of 450 feet, and through the South Pass Bar Channel a depth of -17.0 feet M.L.G. and a width of 600 feet." SP is currently maintained to a depth of -17 ft MLG to provide a navigable channel between the Gulf of Mexico and Venice, Louisiana. When maintained to this depth, the channel is mainly used by commercial fishing vessels, oil and gas supply boats, crew boats, tows, seagoing barges, and recreational vessels.

7.2 Dredging Quantities

In order to determine if dredging and disposal practices are sufficient for the next 20 years, the PA considered historical dredging quantities for the past 10 years for the current project (Table 2), and then made projections of future dredging requirements for the current project (Table 3). Estimates of future dredging quantities are limited to the reaches that currently require routine O&M. Estimates for the proposed 50 ft project depth (Table 4) are based on analysis completed for the GRR/SEIS. The GRR/SEIS only considered deepening for those reaches authorized to 55 ft, and that are not naturally deeper than 55 ft; therefore only RM 13.4 AHP to RM 22 BHP, and the 12 routinely maintained deep draft crossings are included in the table. The other reaches would remain at the current project depths, and are therefore not included in Table 3.

7.3 Dredging Maintenance Cost

The PA considered maintenance cost for dredging of the channel by reach. Table 5 provides the historical dredging cost for the past 10 years for the current project, which were used to make projections of future dredging requirements for the current project (Table 6). Estimates for the proposed 50 ft project depth (Table 7) are based on cost estimates completed for the GRR/SEIS. Since the GRR/SEIS only considered deepening for those reaches authorized to 55 ft that are not naturally deeper than 55 feet in the current condition, only SWP and the deep draft crossings are included in the table.

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Table 2 Dredging History

Reach	Primary Dredging Plant	Dredging History (CY*1000 per year)										Disposal Site
		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
12 Deep-Draft Crossings	Dustpan / Hopper	11,762,086	28,123,851	26,270,682	22,994,560	21,157,026	22,225,780	15,924,242	18,463,464	16,762,344	39,925,159	Miss River
New Orleans Harbor Approach Channel	Cutterhead	1,228,325	731,611	1,003,474	1,106,763	675,266	669,469	778,389	883,373	482,195	772,933	Miss River
RM 11 AHP to 22 BHP	Hopper	10,886,560	13,348,156	15,332,018	19,872,966	10,993,905	12,011,650	10,126,451	5,821,020	7,982,376	13,495,531	HDDA or ODMDS
	Cutterhead	0	0	2,896,991	3.192,431	3,586,342	5,660,955	5,656,851	7,977,940	11,263,272	8,500,209	BU
HDDA	Cutterhead	4,226,078	4,013,912	0	6,527,685	1,805,022	0	8,022,655	0	9,646,404	0	BU
SP	Cutterhead	4,488,377	0	0	0	0	0	0	0	0	0	BU
Overall Project Total		32,631,426	46,217,530	45,503,165	53,694,405	38,217,561	41,355,128	39,721,314	33,145,797	43,837,296	62,693,832	

SP – South Pass

HDDA - Head of Passes hopper dredge disposal area

ODMDS – Ocean Dredged Material Disposal Site

BU – Beneficial Use Disposal Site Within Federal Standard Limits

Table 3 Projected Average Annual Quantities for O&M of the current project depth for the next 20 years

Reach or Segment	Type of Dredge	Average Annual Quantity (CY)
12 Deep-Draft Crossings	Dredging	23,100,904[1]
New Orleans Harbor Approach Channel	Dredging	918,581[2]
RM 11 AHP to 22 BHP	Hopper Dredging	11,987,063
	Cutterhead Dredging	9,282,507
	HDDA Disposal Site	9,000,000
SP[3]	Dredging:	5,000
	Disposal Site	N/A
	Total:	59,245,313

Table 4 Projected Average Annual Quantities for O&M of the 50 ft project depth for the next 20 years[4]

Reach or Segment	Type of Dredge	Average Annually Quantity (CY)
12 Deep-Draft Crossings	Dredging	26,335,030[5]
RM 11 AHP to 22 BHP	Hopper Dredging	11,987,063
	Cutterhead Dredging	9,282,507
	HDDA Disposal Site[6]	9,000,000
	Total:	59,245,313

[1] Estimated increase of 5% from 23,100,904 CY to 24,255,949 CY every 4 years for possible O&M at crossings that do not require annually maintenance.
[2] Increased 5% above the current project averages
[3] South Pass has not been dredged since 2007, an estimated quantity is included in the event that funding becomes available.
[4] Table only reflects the reaches included in the GRR/SEIS to deepen to 50 ft. All other reaches would remain at the projected quantities as shown in Table 3.
[5] Estimated increase of 5% from 23,622,113 CY to 24,803,218 CY every 4 years for possible O&M at crossings that do not require annually maintenance.
[6] Quantity assumes dredging at -50 ft versus current -40ft.

Table 5 Current Project Maintenance Dredging Costs for last 10 years

Reach or Segment	Dredging Cost ($000 per year)										
		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
12 Deep-Draft Crossings	Dredging:	13,856	33,296	27,713	27,224	31,162	30,000	16,252	22,366	20,065	51,917
New Orleans Harbor Approach Channel	Dredging:	4,372	3,719	5,004	4,716	1,775	1,820	2,569	3,009	1,678	2,231
RM 11 AHP to 22 BHP[1]	Dredging:	34,109	61,305	48,115	96,625	49,308	66,050	61,557	45,714	89,111	65,422
SP[22]	Dredging:	13,976	0	0	0	0	0	0	0	0	0
Overall Project Dredging	Total:	61,188	93,944	79,946	128,525	82,359	97,739	80,254	71,052	117,971	118,358

Table 6 Estimated Maintenance Dredging Costs for the Current Project for the Next 10 years

	Programmed Dredging Cost ($000 per year, consistent with10-year project maintenance schedule)											
Reach or Segment		**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**Avg.**
12 Deep-Draft Crossings[1]	Dredging:	33,829	34,459	35,157	35,860	36,577	37,309	38,055	38,816	39,592	40,384	37,004
New Orleans Harbor Approach Channel	Dredging:	2,254	2,296	2,343	2,389	2,437	2,486	2,536	2,586	2,638	2,691	2,466
RM 11 AHP to 22 BHP[3]	Dredging:	106,071	108,046	110,234	112,440	114,688	116,982	119,321	121,708	124,142	126,624	116,026
SP	Dredging:	0	0	0	0	0	0	0	0	0	0	0
Overall Project Dredging	Total:	142,154	144,801	147,734	150,689	153,702	156,777	159,312	163,110	166,372	169,699	155,496

[1] Dredging of the HDDA is included in Southwest Pass
[2] South Pass has not been dredged in the last 10 years, although an estimated quantity was included in Table 3 an estimated cost is not included here, as it would only be dredge if additional funding was available under O&M of the project

Table 7 Estimated Maintenance Cost for the Proposed 50 ft Project for the Next 10 years After Project Completion[1]

	Programmed Dredging Cost ($000 per year, consistent with10-year project maintenance schedule)											
Reach or Segment		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	**Avg.**
12 Deep-Draft Crossings[2]	**Dredging:**	40,808	41,624	42,457	43,522	44,172	44,831	45,956	45,956	47,813	48,770	44,683
SWP[3]	Dredging:	112,440	114,688	116,982	119,321	121,708	124,142	126,624	129,156	131,740	134,374	123,118
Overall Project	Total:	153,248	156,312	159,439	162,843	165,880	168,973	172,580	175,112	179,553	183,144	167,708

d.

[1] Reflects the cost only for the portion of the MRSC that would be deepened to 50 ft. All other reaches would maintain the estimates as shown in Table 6.
[2] Deep Draft Crossings: Dredge Hurley rental rate used
[3] SWP: From MCACES for the GRR/SEIS with $17M per year for HDDA added

8 DREDGE MATERIAL DISPOSAL

8.1 Disposal by Project Reach

The following describes the current disposal practices for the project by reach.

8.1.1 Baton Rouge to New Orleans (Deep Draft Crossings)

At the 12 routinely maintained deep draft crossings (as identified in section 7.1.1), shoal material removed during routine O&M is discharged at the surface of the Mississippi River in areas adjacent to the crossings. River currents transport this dredged material downriver from each placement site. Deposition of the dredged material back into the river provides unlimited disposal capacity. There are no nearby opportunities for beneficial use of the dredged material within the limits of the Federal Standard, primarily due to the lack of suitable placement sites along the channel banklines in the vicinity of the crossings as a result of extensive commercial and residential property development. The nearest potential beneficial use placement site is located at about RM 128 AHP. The deep draft crossing located nearest this site is Belmont Crossing located at about RM 152 AHP, approximately 24 miles upriver of the beneficial use site. A 2010 investigation into using deep draft crossing material for beneficial use at this RM 128 AHP site revealed that it would cost approximately $26 million to transport 1 million cubic yards of shoal material from Belmont Crossing to this site. This cost would require a significant increase in the annual O&M budget for the Mississippi River project in order to fund a modest beneficial use project involving a single deep draft crossing.

8.1.2 New Orleans Harbor Area

Shoal material removed from New Orleans Harbor along the wharves located on the Mississippi River's left-descending bank is discharged unconfined at the surface of the Mississippi River in deep-water areas adjacent to the harbor and beyond the -55 ft MLG contour (conversion to LWRP provided in dredging contracts). Open water placement of dredged material into the Mississippi River provides unlimited disposal capacity for this reach of the project.

The New Orleans Harbor is far removed from beneficial use opportunities. The Mississippi River levees and floodwalls, Hurricane Storm Damage Risk Reduction System, railways, highways, businesses, and neighborhoods act as barriers to pipeline access routes that would be required by traditional beneficial use disposal practices to transport dredged material from dredges working in the harbor to any beneficial use disposal sites near the New Orleans metropolitan area. Beneficial use of dredged material from the harbor would require significant modification of the Federal Standard dredging and disposal plan – with orchestration of multiple dredges, transport vessels, and other earth moving equipment operating in tandem to: (1) remove shoal material from the dredging area; (2) load the material onto barges; (3) transport the barges with tugboats to a

hydraulic unloader; (4) hydraulically pump material from the barges with one or more booster pumps thru a pipeline to the beneficial use site; and (5) manage dredged material placement at the beneficial use site. Such an operation contrasts sharply with a typical harbor maintenance event that relies on a single cutterhead dredge discharging shoal material into the open waters of the river with no more than 1,200 ft of pipeline.

In FY 2012, CEMVN evaluated a scenario for transporting 1 million cubic yards of dredged material from the New Orleans Harbor to a 150-acre swamp restoration site near the Inner Harbor Navigation Canal (IHNC) Lock and just south of Bayou Bienvenue. The restoration site lies within a former Mississippi River Gulf Outlet disposal site. Marsh buggies would first prepare the site by excavating about 57,000 cubic yards of material from within the site to refurbish 12,000 ft of existing perimeter dikes and construct 1,000 ft of new containment dikes. After completion of the dikes, dredged material would be removed from the harbor with a cutterhead dredge and loaded onto barges. The barges would then be transported through the IHNC Lock to an offloading area along the south bank of the Gulf Intracoastal Waterway. A hydraulic unloader would pump dredged material from the barges through 4,000 ft of pipeline across a 200 ft wide access corridor to the swamp restoration site. Material would be allowed to stack to an elevation of about 3 ft North American Vertical Datum, 1988 (NAVD). The estimated cost of this beneficial use effort would exceed $35.5 million, which exceeds the Federal Standard, and would not be implemental under the MRSC O&M program.

8.1.3 New Orleans to the Gulf (including Southwest Pass)

Hopper dredges working from RM 11.0 AHP to RM 11.0 BHP utilize the HDDA for disposal purposes. Dredged material has been placed unconfined in the HDDA since at least the 1940s by dredges performing routine maintenance of the Mississippi River and SWP navigation channel. The HDDA was originally considered to be a self-scouring disposal site that did not require the secondary removal of dredged material placed there by dredges performing maintenance of the Mississippi River navigation channel. However, a combination of natural channel in-filling of the HDDA site along with its use as a maintenance dredging disposal site has gradually resulted in reduced disposal capacity over time. In 1998, it was decided that the HDDA required maintenance dredging to re-establish disposal capacity for hopper dredges. Since 1998, the HDDA has been dredged a total of eight times (1998, 2004, 2007, 2008, 2010, 2011, 2013, and 2015). A total of approximately 39,458,015 cubic yards have been removed from the HDDA by cutterhead dredges. From 2007 through 2016, a total of approximately 69,200,073 cubic yards of SWP dredged material have been placed in the HDDA by hopper dredges performing routine maintenance dredging of the channel.

Maintenance dredging of the HDDA occurs about every 2 years with current contracts requiring the removal of 6 to 8 million cubic yards per maintenance event. Hopper dredges currently place

an average of about 6.9 million cubic yards of dredged material into the HDDA each year. HDDA dredged material removed by cutterhead dredges has been placed into shallow open water areas located in the Delta National Wildlife Refuge and West Bay for wetlands development in a manner consistent with the regulations regarding the Federal Standard. During 2015, a Louisiana Coastal Area Beneficial Use of Dredged Material (LCA BUDMAT) project paid for the removal and placement of approximately 2.3 million cubic yards of HDDA dredged material in West Bay for coastal habitat development. There are additional planned LCA BUDMAT projects that may use material from the HDDA for beneficial use, one of which is currently being constructed in the vicinity of Tiger Pass, near Venice, Louisiana, which plans to use 1.65 MCY of dredged material from the HDDA for marsh creation. To date, approximately 4,108 acres of wetlands have been created by placement of HDDA dredged material. Over 20,000 acres of shallow open water remain available for placement of HDDA dredged material. This available placement area should be sufficient to provide disposal capacity for HDDA maintenance events well beyond the next 20 years. Therefore, hopper dredges workingfrom RM 11 AHP to RM 11 BHP reach should be able to continue using the HDDA for maintenance dredging disposal purposes through the next 20 years as long as HDDA maintenance dredging is performed on at least a biannual basis.

Hopper dredges working in the RM 11 BHP to RM 22 BHP reach either utilize the existing ODMDS for dredge-and-haul disposal, or discharge dredged material by working in agitation dredging mode. The SWP ODMDS has been used for annual maintenance dredging of SWP since at least 1940. From 2007 to 2016, approximately 44,022,949 cubic yards of dredged material have been placed in the SWP ODMDS during routine maintenance dredging events. Because of the highly dispersive nature of the SWP ODMDS, there is no accumulation of dredged material placed within its boundaries over time.

Beneficial use opportunities for hopper dredges working in the SWP navigation channel are limited to these dredges utilizing hopper pump-out disposal operations instead of the more typical dredge-and-haul or agitation dredging modes.

In November of 2008 CEMVN Operations Division completed a review of hopper dredge pump-out titled “Mississippi River Southwest Pass Hopper Dredge Pump-Out Review”. The report concluded for purposes of maintaining the entire SWP channel, the hopper dredge pump-out method is significantly more expensive than the current method of dredge-and-haul open water disposal in the HDDA and/or the ODMDS. If all dredging were performed with hopper dredge pump-out disposal operations, the cost of SWP maintenance dredging would increase by about $18 million annually based on 2008 costs. Because this is outside the Federal Standard, the MVN would not be able to fund hopper dredge pump-out operations for the entire SWP channel without an additional source of funding, provided or cost-shared under an authorization other than the authorization for this project, to cover the incremental cost of performing beneficial use of dredged material through hopper dredge pump-out operations.

Cutterhead dredges working in the SWP RM 4.0 AHP to RM 18.8 BHP reach utilize shallow open water and eroded marsh disposal areas located on either side of the channel for coastal habitat creation within the limits established by the regulations regarding the Federal Standard. From 2007 through 2016, a total of approximately 48,415,623 cubic yards of SWP dredged material have been removed by cutterhead dredges during routine maintenance events and used beneficially to create coastal habitats. A total of about 15,293 acres of coastal habitat have been created by cutterhead placement of dredged material to date. Approximately 55,000 acres of shallow open water and eroded marsh habitat are available for future beneficial use placement of SWP dredged material within the Federal Standard limitations on beneficial use of dredged material. There is sufficient disposal capacity for cutterhead dredges working in SWP for well beyond the next 20 years.

8.1.4 South Pass

Dredged material removed from the SP navigation channel is beneficially placed into shallow open water areas (within the limitations imposed by the regulations on the Federal Standard) located in the Pass a Loutre Wildlife Management Area (PALWMA) on either side of the channel. There are over 60,000 acres of available placement sites in the PALWMA. Dredged material is placed at these sites in a manner conducive to the development of a variety of coastal habitat including marsh, bird islands, and maritime forest ridges. To the extent possible, within the limits of the Federal Standard and USACE authority under Federal laws and regulations, including, but not limited to, those deriving from the Federal Navigation Servitude, disposal operations in the PALWMA are closely coordinated with Louisiana Wildlife and Fisheries Department personnel responsible for managing this area in an effort to minimize conflicts with the State of Louisiana's management priorities for the PALWMA. If the SP navigation channel is funded for dredging in the future, this available acreage would provide adequate disposal capacity for SP maintenance dredging efforts for well beyond a twenty year period.

8.1.5 Dredged Material Disposal for the proposed 50 ft project

Under the proposed 50 ft project it is anticipated the current dredging and disposal practices would continue. The GRR/SEIS investigated impacts of deepening to 50 ft on current dredging quantities and cost. Hydraulic modeling completed by the Engineering Research and Development Center (ERDC), for the reach from RM 11 AHP to RM 11 BHP,, indicated that deepening the channel from the current -48.5 ft to a depth of -50 ft MLLW had little to no impact on the estimated dredging quantities. Therefore deepening the channel does not impact current dredging and disposal practices, and these practices may continue under both the current project and the proposed deepening.

In order to determine if deepening from -45 ft to -50 ft LWRP would have an impact on dredging and disposal practices in the crossings proposed for deepening under the GRR/SEIS, ERDC completed additional modeling and analysis. The purpose of this additional work was to determine the degree to which the current practices of dredging the crossings, and placement of dredged material in the Mississippi River impacted dredging further downstream for both the current project and the proposed deepening. The modeling indicated that the current practices result in re-handling approximately 18% to 32% of material for the 45 ft channel. For the 50 ft channel, there is not a significant increase, with re-handling of material estimated at 21% to 36%. Results of that analysis are included in Appendix H of the GRR/SEIS.

The results of the analysis indicate that deepening the channel from the current -45 ft to -50 ft LWRP does not affect the current dredging and disposal practices for the crossings; therefore, the current dredging practices may continue under the proposed deepening to 50 ft.

9 ECONOMIC ASSESSMENT

For purposes of this PA, data from the Waterborne Commerce Statistics Center (WCSC) was used to evaluate the impacts that would occur to deep-draft navigation if continued maintenance dredging were eliminated, thereby resulting in a loss of project depth. It was assumed that vessels impacted would have to light load to meet draft restrictions, and those tons of cargo unable to be transported on the first transit will have to be transported on another transit. Currently, the constructed depth of the Mississippi River from Baton Rouge to the Gulf of Mexico is 45 ft. Increasingly greater loss of depth over time was assumed up to a maximum loss corresponding to a 30 ft channel. Because WCSC data lists number of vessel trips by draft traveling on this segment of the river, it is possible to estimate the number of trips that would be affected by a loss of draft. Immersion factors by vessel type and size, developed by USACE's Institute of Water Resources (IWR), were then used to determine the amount of tons vessels would have to unload to accommodate a 30ft channel. Ocean freight rates per ton were used to calculate the added cost of shipping the unloaded tons. For this exercise, ocean freight rates for transporting grain from the Gulf of Mexico to China was used to represent a typical cargo trip operating on this waterway.

Using 2015 WCSC data, a total of 5,676 trips and 116,507,426 tons would have been affected by a 30 ft channel, resulting in a total annual cost of $3.9 billion. Because the complete elimination of maintenance dredging would result in a channel not as deep as 30 ft and future traffic growth is expected, this figure represents a minimum estimate of the impact for maintenance elimination. When the average annual with-project maintenance benefits ($3.9 billion) are compared to average annual historic maintenance costs of about $95 million, continued maintenance of the project is clearly economically justified.

Table 8 Economic Summary for the Current Project

	Average Annual[1]			
Reach or Segment	Maintenance Cost	Trips Affected	Tons Affected	Navigation Benefits
Baton Rouge to Head of Passes	$95 million	5,676	116,507,426	$3.9 billion

The proposed deepening of the MRSC to a depth of 50 ft has average annual construction costs of $9.2 million and average annual maintenance costs of $8.5 million for a total average annual cost of $17.7 million. The USACE certified simulation model HarborSym was used to capture transportation cost savings resulting from the reduction in the amount of light-loading of vessels operating in the deeper channel. These average annual benefits total $127.5 million. Total average annual benefits minus total average annual costs equals the average annual net benefits of the project which in this scenario comes to $109.8 million. The B/C ratio is accordingly 7.2 to 1 (using 2017 price levels and the FY18 Federal discount rate of 2.75%).

The GRR/SEIS provides the Economic justification for the proposed 50 ft project depth.

10 ENVIRONMENTAL COMPLIANCE ASSESSMENT

Numerous National Environmental Policy Act (NEPA) documents have been completed regarding dredging of the Mississippi River, designating disposal areas, and related actions in the project area. There are several previously cleared CEMVN disposal areas in the Mississippi River Delta region that comprise 143,264 acres. These disposal areas and associated NEPA documents are discussed in this section and existing disposal areas are shown in Figure 5.

A Final Environmental Impact Statement (FEIS) was prepared in March 1976 for the Mississippi River, Baton Rouge to the Gulf of Mexico project. This FEIS was prepared to evaluate the potential impacts of maintenance dredging of the Mississippi River and passes from Baton Rouge, Louisiana to deep water in the Gulf of Mexico. It provided for construction and maintenance of a channel 40 deep and 750 ft wide for 20.1 miles along SWP. Disposal of material was designated upon marshland and spoil bank along SWP or in the Gulf of Mexico (Table 9).

[1] 2017 price levels were used. A grain rate of $33.65 obtained from USDA's Grain Transportation Report was used to calculate navigation benefits.

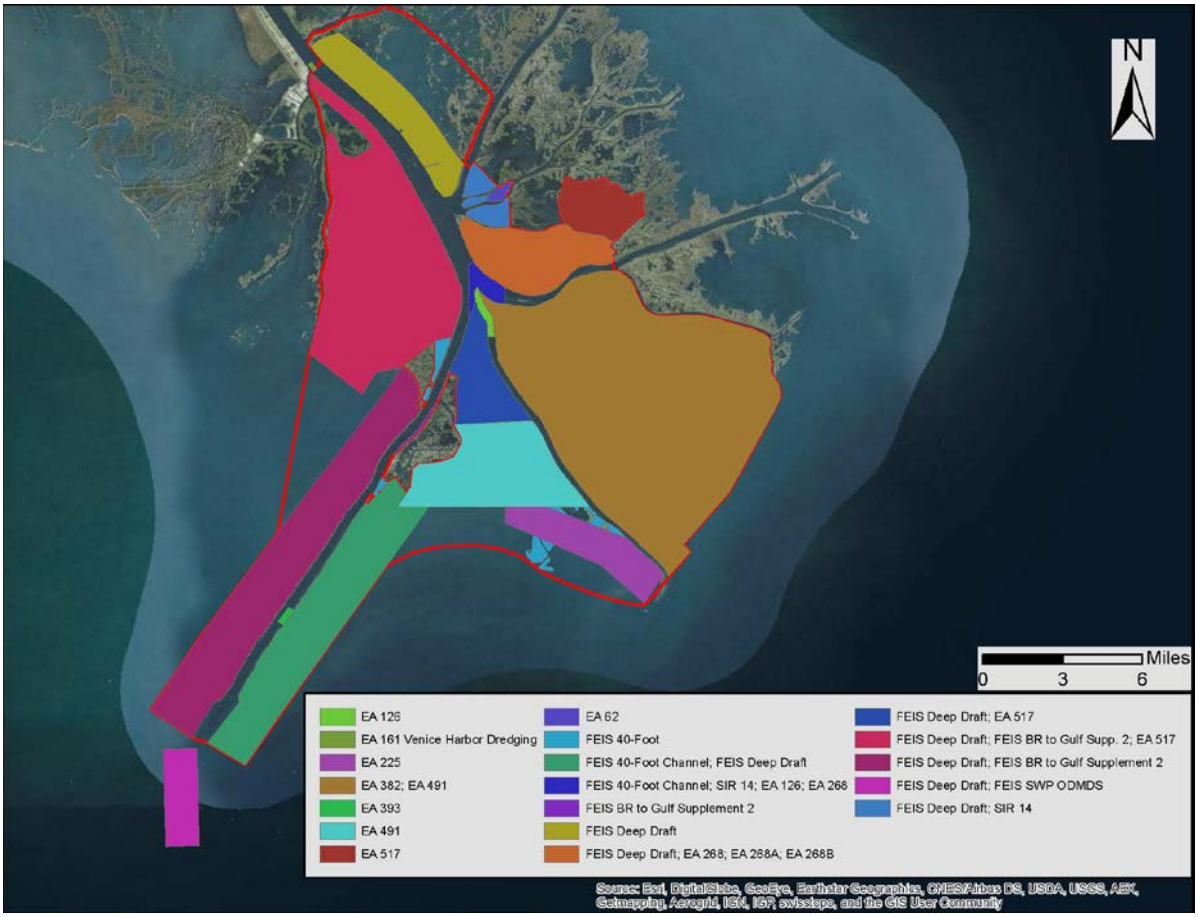

Figure 5 Previously cleared disposal areas and their associated NEPA documents.

Table 9 NEPA documentation for channel dimensions

Project Reach		Authorized Dimensions Depth x Width	Advanced Maintenance Depth	Allowable Over Depth	NEPA COMPLIANCE DOCUMENT
Baton Rouge to New Orleans (Deep Draft Crossings)		-55’ x 500’	2’	2’	Miss River Deep Draft FEIS 1982 (55’ channel)
					EA # 68 Adv. Maint. & Over depth (17 Dec 87)
New Orleans to RM 12 AHP		-55’ x 750’	2’	2’	Miss River Deep Draft FEIS 1982 (55’ channel)
					SIR #9 Deep Draft Adv. Maint. & Over depth (23 Aug 85)
RM 12 AHP to RM 18 BHP (SWP)		-55’ x 750’	6’	2’	Miss River Deep Draft FEIS 1982 (55’ channel)
					SIR #9 Deep Draft Adv. Maint. & Over depth (23 Aug 85)
					NEPA Categorical Exclusion SWP Adv. Maint. (13 Jan 16)
					Phase III SEIS (Scheduled for 2018)
RM 18 BHP to RM 22 BHP (SWP)		-55’ x 600’	6’	2’	Miss River Deep Draft FEIS 1982 (55’ channel)
					SIR #9 Deep Draft Adv. Maint. & Over depth (23 Aug 85)
					NEPA Categorical Exclusion SWP Adv. Maint. (13 Jan 16)
SP	Inland	-30’ x 450’	N/A	N/A	Miss River Baton Rouge to Gulf FEIS 1974
	Bar	-30’ x 600'	N/A -	N/A	
Shallow Draft Crossings		-12’ x 300’	-	-	Miss River & Tributaries FEIS 1976
New Orleans Harbor		-40’ x 500’	2’	2’	Miss River Deep Draft FEIS 1982 (55’ channel)
					EA #68 (17 Dec 87)

A Supplement to the FEIS for the Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana project was prepared in March 1976. Additional disposal areas were added at the entrance of Pass a Loutre and in the shallow waters of East and West Bays adjacent to SWP on the east and west side of the channel.

A Record of Decision was signed on 26 December, 1986 for the FEIS for the MRSC Gulf to Baton Rouge, Louisiana project. This FEIS addressed the deepening of the MRSC from the Gulf of Mexico to Baton Rouge as described in the 1983 Chief's Report.

Environmental Assessment (EA) #126, "Additional Disposal Areas for Mississippi River Ship Channel, Gulf of Mexico to Baton Rouge, Louisiana," assessed the potential impacts associated with the designation of an additional in-river disposal area (i.e., the HDDA) located at the Head of Passes for hopper dredges to use during periods in the dredging season when the existing open water disposal area at the mouth of Pass a Loutre reached capacity and hopper dredges could no longer use it for disposal. This EA is the original NEPA document designating the HDDA. A deep water area, deeper than -19 ft, in the two-mile reach at the head of SP was proposed as an additional open water hopper dredge disposal area. A finding of no significant impact (FONSI) was signed January 7, 1991. In a letter to various agencies dated March 4, 1991, USACE changed the plan for using the proposed Head of Passes hopper dredge disposal area. Instead of using the Head of Passes hopper dredge disposal area only when the existing in-river Pass a Loutre disposal area was filled, the new plan allowed for the use of each area simultaneously during times when multiple hopper dredges were working to better maintain the navigation channel when rapid shoaling occurred. Only the northernmost portion of this open water disposal area has been used by hopper dredges working in SWP. The large size of hopper dredges typically used to perform maintenance dredging in the SWP channel precludes usage of the portion of this open water disposal area that occupies the SP channel. Difficulties in turning these large hopper dredges around within the confines of the SP banklines following discharge of dredged material has resulted in the under-utilization of the majority of this disposal area.

EA #225, "SP, Designation of an Additional Disposal Area, Plaquemines Parish, Louisiana," assessed the potential impacts of the beneficial use (within the limits of the Federal Standard regulations) of hydraulically dredged material removed from the SP navigation channel to create wetlands along the islands located approximately one mile west of the East Jetty and the right-descending bank of SP. The EA designated a shallow, open-water area encompassing approximately 4,500 acres for the beneficial placement of material removed during SP maintenance dredging. Material would be placed adjacent to and gulfward of existing barrier islands to stabilize and enlarge the features, and would also be placed in shallow, open-water areas to create new barrier islands. The associated FONSI was signed on March 8, 1996. This disposal area has been used from 24 July 1999 through 12 June 2000 and from 12 September 2006 through

23 January 2007 for placement of dredged material removed during maintenance of the SP navigation channel.

EA #267, "Mississippi River, Baton Rouge to the Gulf, Dustpan Dredging and Stockpile Disposal for Beneficial Use," evaluated the potential environmental impacts associated with the designation of 4,300 acres of shallow open-water located in front of existing foreshore dikes lining both sides of SWP as stockpile disposal areas. These stockpile areas would be used for temporary placement of material removed during routine maintenance by dustpan dredges in the Mississippi River/SWP between RM 3.5 AHP and RM 18.8 BHP. The dredged material would be removed from the stockpile disposal areas by cutterhead dredge and placed adjacent to SWP in previously-designated open-water permanent disposal areas for shoreline nourishment and wetlands development. Increased use of dustpan dredges was proposed to reduce the dependency on hopper dredges in order to reduce the amount of dredged material from this reach placed in the Head of Passes hopper dredge disposal area, or at the lower channel and jetty reach by agitation dredging, or at the ODMDS. The use of dustpan dredges increases the amount of material available for beneficial use to the extent possible under the limitations of the regulations regarding the Federal Standard. The associated FONSI was signed on April 22, 1997. The stockpile areas described in this EA have never been used during SWP routine maintenance dredging efforts.

The Environmental Impact Study (EIS) entitled "West Bay Sediment Diversion, Plaquemines Parish, Louisiana" addressed an uncontrolled, sediment-rich freshwater diversion through the west bank of the Mississippi River at River Mile 4.7 above Head of Passes as a part of the work performed pursuant to the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), as authorized by Title III of Public Law 101-646), which does not form a part of the MRSC project. The EIS also covered maintenance dredging of the Pilottown Anchorage Area (PAA) (to maintain deep-draft access) and the beneficial use placement of the dredged material into the West Bay "marsh creation area," to mitigate for adverse impacts to navigation in the Mississippi River, as was anticipated and discussed in the EIS. The ROD for the EIS was signed on 18 March 2002. This EIS was the NEPA compliance document for Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) project MR-02. The marsh creation disposal area was used during the initial construction of the West Bay Sediment Diversion in 2002, and when the PAA was dredged in FY 2006 and 2013. In the 82nd meeting of the Louisiana Coastal Wetlands Conservation and Restoration Task Force. held on 11 October 2012, a discussion was held on the closure of the West Bay Project and dredging of PAA under CWPPRA. The Task Force was created by the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA, commonly known as the Breaux Act), which was signed into law (PL 101-646, Title III) by President George Bush on November 29, 1990.The decision was made that under CWPPRA the PAA would be dredged one final time, and this would fulfill CWPPRA's dredging responsibility for so long as the diversion remains open and operational. This final dredging occurred in FY 2013.

EA #268, "Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana, Management of Pass a Loutre/SP Open-Water Disposal Area," evaluated the potential impacts associated with the designation of a 1,620-acre disposal area located in an area of shallow open water north of Pass a Loutre (i.e., the HDDA). Material would be dredged from the HDDA by a cutterhead dredge and placed unconfined in the disposal area in a manner conducive to marsh restoration to the extent possible under the regulations regarding the Federal Standard. The associated FONSI was signed on April 17, 1997. Supplemental EA #268A, with associated FONSI signed June 4, 2002, was prepared to address the impacts associated with modifying the disposal plan for dredged material approved in EA #268 to allow for the deposition of dredged material in a design mimicking natural peninsulas, with 100ft gaps cut to provide intertidal exchange and create more diverse habitat. Supplemental EA #268B, "Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana, Designation of Additional Disposal Area, Pass a Loutre/SP," was prepared to address the impacts associated with expanding the Pass a Loutre beneficial use area cleared in EA #268. The expansion encompassed an additional 3,300 acres of shallow open water and eroding marsh. The FONSI for Supplemental EA #268B was signed on October 3, 2008. This disposal area was used during HDDA maintenance dredging efforts in 1998, 2004, 2007, 2010-2011, and 2012.

EA #382, "Freshwater Reservoir Additional Disposal Area, SP of the Mississippi River, Plaquemines Parish, Louisiana," evaluated the potential impacts associated with the designation of an additional 640-acre disposal area within an abandoned freshwater reservoir located in the Pass a Loutre WMA for the beneficial use (to the extent possible under the regulations regarding the Federal Standard) of material removed from SP during maintenance dredging events. The associated FONSI was signed on August 20, 2003. A portion of this disposal area (the 245-acre north cell) in the freshwater reservoir was used during 2006 the 12 September 2006 through 23 January 2007maintenance dredging of the SP navigation channel.

EA #393, "SWP of the Mississippi River, Burrwood Bayou Outlet Additional Disposal Area and Flow Control Features, Plaquemines Parish, Louisiana," evaluated the potential environmental impacts associated with the proposed designation of an approximately 154-acre open water disposal area and the construction of flow control features in SWP at the Burrwood Bayou outlet to East Bay located approximately 14 RM BHP. These features were proposed to reduce a navigation hazard caused by the formation of a large scour area at the intersection of SWP and Burrwood Bayou. The associated FONSI was signed December 8, 2003. Currently it has not been necessary to utilize this disposal area.

EA #491, "Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana, Designation of Additional Disposal Areas, Plaquemines Parish, Louisiana," evaluated the potential environmental impacts associated with the designation of two additional disposal areas for the beneficial use of dredged material (to the extent possible under the regulations regarding the Federal Standard) removed during routine maintenance dredging of SP, SWP, and the open water HDDA located at

the heads of Pass a Loutre and SP in Plaquemines Parish, Louisiana. The first new disposal area, East Bay Disposal Area, would be a 9,800-acre expansion of existing disposal areas located between SWP and SP in East Bay of the Mississippi River Delta. The second new disposal area, Wildlife Management Area Disposal Area, would be a 41,100-acre expansion of existing disposal areas located between SP and Southeast Pass in the Pass a Loutre WMA. Dredged material would be placed unconfined, wherever possible, in shallow open water within the proposed disposal areas and may be used to mimic natural peninsulas, islands, and other land features that are supportive of both nesting habitat for mottled ducks and migratory songbirds along the crowns, with emergent intertidal wetland vegetation taking root along the lower elevations of the placement area slopes and fringes. The associated FONSI was signed on November 11, 2011.

EA 547, MVN designated multiple additional disposal areas for the beneficial-use placement of dredged material (to the extent possible under the regulations regarding the Federal Standard) removed during maintenance dredging of the main stem Mississippi River, SWP, SP, and the Head of Passes hopper dredge disposal area (HDDA) located in the Mississippi River, Baton Rouge to the Gulf of Mexico, Louisiana, Federal navigation project. The proposed disposal areas are located in Plaquemines Parish in southeastern Louisiana in the active delta of the Mississippi River. Dredged material can be placed in West Bay; adjacent to the upper SWP and SP navigation channels within the Pass a Loutre Wildlife Management Area (Pass a Loutre WMA); and within the Delta National Wildlife Refuge (Delta NWR) located north of Pass a Loutre. The associated FONSI was signed on November 22, 2013.

A categorical exclusion with an entitled subject: "Request for Preparation of Environmental Compliance Document for Additional Advance Maintenance for the Mississippi River Ship Channel, Gulf to Baton Rouge, Louisiana Project" was completed on January 13, 2016. This exclusion referenced USACE Engineering Regulation 200-2-2, "Procedures for Implementing NEPA", paragraph 9, "Categorical Exclusions", subparagraph 9.b., "Minor maintenance dredging using existing disposal sites" to determine that increasing advanced maintenance from 2 ft to 6 ft resulted in minor impacts. Advanced maintenance dredging of 6 ft would result in a temporary river depth of 53 ft (45 ft depth plus 6 ft advanced maintenance and 2 ft of allowable over depth) from RM 12 AHP to RM 18 BHP. This action was categorically excluded from further NEPA documentation because impacts associated by dredging the river to a temporary depth of 59 ft (55 ft depth, plus 2 ft advanced maintenance, and 2 ft allowable over depth) were previously documented and evaluated in prior studies. It was determined impacts associated with 6 ft of advanced maintenance at current project depths would be short-term in duration due to significant shoaling and that an advanced river maintenance of 6 ft in this area would decrease dredging frequency, and actually decrease the frequency of environmental disturbance.

SEIS 15-1, Although the project is currently authorized to a depth of 55 ft, the integrated GRR/SEIS was prepared to assess potential changed conditions and assumptions related to the

MRSC depth, economic development, and environmental assessments since the 1981 Feasibility Report. A draft integrated GRR and SEIS was released for public and agency comment on December 16, 2016 (http://www.mvn.usace.army.mil/About/Mississippi-River-Ship-Channel). The plan that was described in the draft report was changed as a result of information obtained from additional modelling after the draft report was released to the public. The current final GRR/SEIS discloses plans to provide deep draft navigation to a depth of 50 ft from the Gulf of Mexico through the Port of Baton Rouge with the exception of the portion of the project that provides an approach channel to the Port of New Orleans. This included deepening 12 river crossings from -45 ft to -50 LWRP. This also entailed deepening and maintaining various shoals from -48.5 ft to -50 ft MLLW, from RM 13.4 AHP to RM 22 BHP via SWP. Approximately 2/3 of all material dredged during construction would be used beneficially to create approximately 1460 acres of coastal wetland habitat in lower Plaquemines Parish, Louisiana. Deepening would only occur within previously disturbed reaches that are actively maintained by CEMVN for navigation purposes because all other reaches are either naturally deeper than the authorized 55 ft or deepening beyond the current depths is not warranted to achieve full project benefits. . The current final integrated GRR and SEIS are scheduled for approval in FY 2018.

11 FINDINGS AND RECOMMENDATIONS

The purpose of this PA is to determine the disposal plan for the next 20 years of dredging in the MRSC Project for both its current depth and the proposed 50 ft deepening that is recommended in the on-going GRR/SEIS. It demonstrates that there is sufficient capacity for the dredged material for the next 20 years, under both project depths.

Adequate disposal sites and capacity exists for all reaches of this project. Disposal for the deep-draft crossings and New Orleans Harbor (the approach channel) is into the Mississippi River, while placement of dredged material in the lower reaches of the project consists of: 1) cutterhead dredge beneficial use placement within the limits of the Federal Standard, 2) hopper dredge open water non-beneficial use placement at the HDDA, 3) hopper dredge open water non-beneficial use disposal by agitation dredging, and 4) hopper dredge open water non-beneficial use placement into the designated ODMDS. The proposed deepening to 50 ft does not necessitate a need to change these dredging and disposal practices. Findings of the economic assessment determined that the navigation project is economically justified, since the costs of maintaining the channel are more than offset by the economic benefits to the Nation. All maintenance dredging and disposal activities are in compliance with existing environmental laws and regulations. There is no need to continue this effort with a second phase to include a more detailed DMMP study, as there are no impediments to continuing maintenance as reported in Table 10. This PA is in compliance with Engineering Regulation 1105-2-100.

Table 10 Maintenance Limitations

The ability to maintain this project for the next 20 years is limited by	
Disposal Site Capacity	No
Economic Viability	No
Environmental Compliance	No

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