CENWK-OD-R
Applications
(NWK-2011-00361,
NWK-2011-00362,
NWK-2011-00363,
NWK-2011-00364,
MVS-2011-00177,
MVS-2011-00178)

MEMORANDUM FOR RECORD

SUBJECT: Department of the Army Combined Decision Document for Permit Application NWK-2011-00361, NWK-2011-00362, NWK-2011-00363, NWK-2011-00364, MVS-2011-00177, MVS-2011-00178

This document constitutes the Environmental Assessment, 404(b)(1) Guidelines Evaluation, Public Interest Review and Statement of Findings.

1. Application as described in the public notice.

a. APPLICANT(S): Capital Sand Company, Inc. (NWK-2011-00361), Hermann Sand & Gravel, Inc. (NWK-2011-00362), Holliday Sand & Gravel Company (NWK-2011-00363), Con-Agg of Missouri, LLC. (NWK-2011-00364), Limited Leasing Company (MVS-2011-00177*), and J.T.R., Inc. (MVS-2011-00178*), hereafter referred to as the "Dredgers".

*Denotes permits administered by the Regulatory Branch, U.S. Army Corps of Engineers (USACE), Saint Louis District. Remaining permits are administered by the Regulatory Branch, U.S. Army Corps of Engineers (USACE), Kansas City District (KCD).

b. AUTHORIZED AGENT: David Shorr, Lathrop and Gage, LLP. 314 East High Street, Jefferson City, Missouri, 65101

c. WATERWAY & LOCATION: Applicants have proposed renewing permits for commercial sand and gravel dredging within five predefined segments of the Lower Missouri River (LOMR), River Miles (RM) 0.0-498.0.

- Capital Sand Company, Inc.: Waverly, Jefferson City, and St. Charles Segments
- Hermann Sand & Gravel, Inc.: Jefferson City and St. Charles Segments
- Holliday Sand & Gravel Company: St. Joseph, Kansas City, and Waverly Segments
- Con-Agg of Missouri, LLC.: Jefferson City Segment
- Limited Leasing Company: St. Charles Segment
- J.T.R., Inc.: St. Charles Segment

d. LATITUDE & LONGITUDE: N/A

e. PROJECT PURPOSE

(1) Basic: For purposes of the CWA, the basic (fundamental, essential, or irreducible)

purpose of the Proposed Action is to supply the aggregate required to support the region's construction and manufacturing needs.

(2) Overall: The overall Project purpose is to profitably extract sand and gravel from the Missouri River that meet certain specifications in order to supply the region's construction and manufacturing needs.

(3) Water Dependency Determination: No discharges of dredged or fill material into special aquatic sites are proposed or are authorized in this decision. As such, a water dependency determination is not required.

f. PROPOSED WORK:

(1) Project Description: The USACE Kansas City and St. Louis Districts have received 6 permit applications from 6 companies (Dredgers) to extract 6,100,000 (2016), 6,259,500 (2017), 6,419,000 (2018), 6,578,500 (2019), 6,738,000 (2020) tons of sand and gravel annually from specifically identified reaches of the lower Missouri River (LOMR) between St. Louis, Missouri and Rulo, Nebraska (see Table1-1). The applicants include companies who:

- Own and operate dredging equipment, tug boats, and barges and who would dredge sand and gravel from within their requested dredging reaches and deliver it to their own onshore sand plants;
- Own onshore sand plants and contract with other companies to dredge sand and gravel from within their requested dredging reaches and deliver it to onshore sand plants; and
- Own dredging equipment and contract to deliver sand and gravel dredged from their requested dredging reaches to onshore plants owned by other companies.

Dredging activities to be conducted under permits issued by the USACE would include dredging of river sediments from the navigable waters of the LOMR, extraction of suitable sand and gravel, and return (discharge) of some of the dredged material into the river. Dredging for sand and gravel on the LOMR is conducted by using hydraulic suction-head or cutter-head dredges mounted on movable barges. The dredge consists of mechanical equipment mounted on a barge that can be moved into position and anchored during dredging operations. The dredge barge is held in a fixed position during dredging by deploying large, fortress-style anchors from the forward corners of the barge on the end of 1,000- to 2,000-foot-long cables. By selectively manipulating the length of each anchor cable, the dredge can be moved forward, backward, and from side to side during the dredging operation. From a single anchoring position, a dredge can operate in an area approximately 1,000–2,000 feet in length and approximately 400–500 feet in width before moving the anchors. Some dredges include piles (called "spuds") that can be raised and lowered to the river bottom, to assist with maintaining the dredge position.

Table 1-1

Application Number	Applicant Name	River Reach Requested	Annual Tons Of Material Authorized By 2011 DA Permits	Annual Tons Requested (2015 Renewals)
NWK 2011-00361	Capital Sand Company, Inc. (Capital Sand)	St. Charles Segment	140,000	**300,000**
		Jefferson City Segment	1,350,000	**1,350,000**
		Waverly Segment	370,000	**2016 – 370,000**
				2017 – 452,500
				2018 – 535,000
				2019 – 617,500
				2020 – 700,000
NWK 2011-00362	Hermann Sand and Gravel, Inc. (Hermann) Sand)	St. Charles Segment	120,000	**150,000**
		Jefferson City Segment	120,000	**150,000**
NWK 2011-00363	Holliday Sand and Gravel Company (Holliday Sand)	Waverly Segment	770,000	**2016 – 770, 000**
				2017 – 847,000
				2018 – 924,000
				2019 – 1,001,000
				2020 – 1,078,000
		Kansas City Segment	2011 – 1,200,000	**540, 000**
			2012 – 900,000	
			2013 – 850,000	
			2014 – 800,000 *(permit modification)*	
			2015 – 540,000	
		St. Joseph Segment	860,000	**860,000**
NWK 2011-00364	Con-Agg of MO, L.L.C. (Con-Agg)	Jefferson City Segment	160,000	**160,000**

Application Number	Applicant Name	River Reach Requested	Annual Tons Of Material Authorized By 2011 DA Permits	Annual Tons Requested (2015 Renewals)
MVS 2011-00177	Limited Leasing Company	St. Charles Segment	990,000	**990,000**
MVS 2011-00178	J.T.R. Inc. (Jotori Dredging)	St. Charles Segment	460,000	**460,000**
Total (All Dredgers Combined)	2016			**6,100,000**
	2017			**6,259,500**
	2018			**6,419,000**
	2019			**6,578,500**
	2020			**6,738,000**

(2) Avoidance and Minimization Information:

No avoidance and minimization practices were proposed by the applicants in their applications. However, the Dredgers do anticipate adhering to the operational, spatial, and temporal dredging restrictions presented as special conditions under the 2011 permits.

(3) Compensatory Mitigation:

A statement proposing compensatory mitigation was not provided by the applicants in their applications.

g. EXISTING CONDITIONS:

Please refer to the Environmental Impact Statement (Final EIS), finalized 31 March 2011, Section 3.1 for a detailed account of current conditions within the project area and a description of the River's primary uses. Additionally, Section 3.1 identifies the major channel modifications to the River in the last century, including, Reservoir and Dam Construction and Operations, Bank Stabilization and Navigation Project, and a host of Environmental Restoration and Enhancements projects.

The LOMR is that portion of the river from Gavins Point Dam in Nebraska to the river's confluence with the Mississippi River. The LOMR forms the boundary between Nebraska and Iowa, Nebraska and Missouri, and Missouri and Kansas. In Missouri, it traverses the width of the state in a west to east direction, from Kansas City to its confluence with the Mississippi River approximately 50 miles north of St. Louis, Missouri. Throughout its

length, the LOMR is joined by a number of major and minor tributaries.

Numerous towns and cities are located along the LOMR. They include Sioux City, Omaha, St. Joseph, Kansas City, Jefferson City, and St. Charles. St. Louis is the largest major city associated with the Missouri River. Uses along the LOMR include power plants, industrial and commercial businesses, rail yards, marinas, municipal utilities, sand and gravel excavation and processing plants, public parks, and floating casinos.

The floodplain of the LOMR extends well beyond the main channel banks in many locations and is predominantly used for agricultural production, especially row crops. Numerous levees have been built parallel to the river to partially contain the extent of flooding. Roadways and rail crossings cross the river sporadically along its length.

Between Sioux City, Iowa and the Mississippi River, there are no dams or other navigational impediments along the mainstem of the LOMR. Maximum flows vary depending on channel dimensional characteristics, slope, and the configuration of control structures such as revetments, dikes, and channel modifications installed to maintain the navigational channel.

2. Authority.
☒ Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. §403).
☒ Section 404 of the Clean Water Act (33 U.S.C. §1344).
☐ Section 103 Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

a. Jurisdiction: The proposed dredging would take place in the Missouri River. One of the congressionally authorized purposes of the LOMR is navigation, and the LOMR is navigated for various commercial purposes. Under Section 10 of the RHA, the USACE has authority over dredging activities in navigable waters of the United States. An approved Jurisdictional Determination was completed for the LOMR on 23 October 2015.

The LOMR commercial dredging operations extract sand and gravel from the river bed using hydraulic suction dredges. The dredges operated by Holliday Sand & Gravel Company have onboard equipment to sort the dredged material, press the water out of the desired material, and discard unwanted excessively fine or coarse material and water back into the river in a process that takes several minutes. The desired material is discharged onto a barge and the unwanted material is discharged into the river at a point 40 feet or more from the suction dredge head. The other dredges on the LOMR do not have onboard sorting and drying equipment, and discharge the pumped material and water directly through screens onto a barge with slots or drain holes to allow the water to drain out. Dredged material is discharged back into the river in the form of cobbles and debris separated by the screens, and a draining off the barges because the dredged material was not mechanically dewatered. The USACE has determined that the undesired silt, cobbles, and debris that is separated and intentionally discharged back into the river and the suspended silt and sand washed out of the barges with the draining water are discharged back into the river at a point and time that are

substantially different from the point and time of extraction and are therefore regulated under Section 404 of the CWA. This review was conducted in accordance with the procedures described at 33 C.F.R. Part 320-332, including Appendices B and C and this decision is issued under Section 10 of the RHA (33 U.S.C. § 403) and Section 404 of the CWA (33 U.S.C. § 1344).

3. Scope of Analysis.

a. National Environmental Policy Act (NEPA).

(1) Factors.

(i) Whether or not the regulated activity comprises "merely a link" in a corridor type project.
(ii) Whether there are aspects of the upland facility in the immediate vicinity of the regulated activity which affect the location and configuration of the regulated activity.
(iii) The extent to which the entire project will be within the Corps jurisdiction.
(iv) The extent of cumulative Federal control and responsibility.

(2) Determined scope.
☒ Only within the footprint of the regulated activity within the delineated water.
☐ Over entire property.

Explain: The Final EIS, this decision document, and the Waverly Environmental Assessment (EA) (Appendix 7) directly consider those activities within the jurisdiction of the USACE under Section 10 of the RHA and Section 404 of the CWA. This includes extraction of sand and gravel resources from the river bed using hydraulic dredging equipment. Changes to operations of vessels and barges on the river; moored off-loading barges; and land-based materials handling, stacking, and processing at sand plants are not proposed and therefore are not within the purview of this Section 10 and Section 404 permit decision. Proposed changes to these activities would be evaluated by the relevant state or federal permitting authorities. Dredging operations are evaluated in the Final EIS and this EA to the extent that indirect impacts may be associated with these activities.

The geographic scope of the Final EIS includes that portion of the LOMR subject to commercial sand and gravel dredging that extends from its confluence with the Mississippi River at river mile (RM) 0 to RM 498 near Rulo, Nebraska. It also includes the portions of tributaries to the Missouri from RM 0 to RM 498 that are immediately adjacent to the main channel of the LOMR, to the extent that they may be indirectly affected by river bed degradation, and the region surrounding the Project area portion of the river to the extent that specific resources may be affected by dredging or use of alternate sources of sand and gravel. For example, the broader sand and gravel market areas are included when evaluating alternate sources of sand and gravel, and some entire counties are considered when evaluating potential air quality impacts.

b. Section 106 of the National Historic Preservation Act "Permit Area".

(1) Tests. Activities outside the waters of the United States **are** included because all of the following tests **are** satisfied: Such activity **would not** occur but for the authorization of the work or structures within the waters of the United States; Such activity **is** integrally related to the work or structures to be authorized within waters of the United; and Such activity **is** directly associated (first order impact) with the work or structures to be authorized.

Explain: Project-related activities with the potential to directly affect historic properties include excavation and removal of sand and gravel from the main channel of the LOMR. Potential indirect effects that may result from increased river bed degradation related to dredging include erosion, induced instability, headcutting, and related channel effects from dredging activities. Areas affected by erosion induced by headcutting could include banks of the LOMR and localized areas of tributaries. Because of the above known and potential impacts, the Permit Area for this Project was determined to include the main channel of the LOMR from the confluence of the Missouri and Mississippi Rivers in St. Louis, Missouri (RM 0) to Rulo, Nebraska at RM 498 and extending from the top of bank to approximately 50 feet below the river bottom (i.e., the greatest potential depth of dredging activities). The Permit Area also includes perennial tributaries joining the LOMR for a distance of 0.25 mile upstream or to the first upstream control point. A "control point" includes any natural streambed feature or human-made structure that provides grade control and controls or impedes the upstream progress of a headcut. Because degradation of the tributaries is not likely to extend more than 20 feet beyond the current banks of the LOMR and its tributaries, the Permit Area extends 20 feet landward of each bank.

Sand plants owned and operated by the dredging permit applicants are not included in the Permit Area as they were previously permitted by the USACE, if authorization was required. It is reasonably foreseeable that some alternatives may result in extraction of sand or gravel from new upland mining sources. These upland mining sources are not included in the Permit Area for this Project because actions related to the upland mining sources would not be subject to any of the USACE permits that would be issued under this Project. Construction and operation of proposed sand plants and alternate mining sources were considered in the indirect effects analysis in Section 4.13 of the Final EIS.

(2) Determined scope. *Describe.* Per the above description the established NHPA scope of analysis for this project encompasses the main channel of the LOMR from the confluence of the Missouri and Mississippi Rivers in St. Louis, Missouri (RM 0) to Rulo, Nebraska at RM 498 and extending from the top of bank to approximately 50 feet below the river bottom (i.e., the greatest potential depth of dredging activities). The Permit Area also includes perennial tributaries joining the LOMR for a distance of 0.25 mile upstream or to the first upstream control point. A "control point" includes any natural streambed feature or human-made structure that provides grade control and controls or impedes the upstream progress of a headcut. Because degradation of the tributaries is not likely to extend more than 20 feet beyond the current banks of the LOMR and its tributaries, the Permit Area extends 20 feet landward of each bank

c. Endangered Species Act "Action Area".

(1) Action area means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.

(2) Determined scope. *Describe.* The Action Area includes the main channel and floodplain of the LOMR from the confluence of the Missouri and Mississippi Rivers in St. Louis, Missouri (RM 0) to Rulo, Nebraska at RM 498. The Action Area also includes perennial tributaries joining the LOMR for a distance of 0.25 mile upstream or to the first upstream control point. A "control point" includes any natural streambed feature or human-made structure that provides grade control and controls or impedes the upstream progress of a headcut.

d. Public Notice and comments. Public Notice issued **13 March 2015** for a 21-day comment period, expiring on **03 April 2015**. (Appendix 1)

(1) Requests for a Corps public hearing or meeting **were** received for this project.

WaterOne, in a letter dated 2 April 2015 (Appendix 2), provided comments regarding commercial dredging on the Missouri River and requested a public hearing to gain a broader view on the purported wide-spread impacts of commercial dredging on Missouri River stakeholders.

The KCD Regulatory Branch (OD-R) contacted WaterOne to further discuss their concerns. Via email and a phone call on 8 April 2015 and an in person discussion on 4 August 2015, Matthew Sailor spoke with Ms. Darci Meese of WaterOne about the details of their request. Ms. Meese indicated that WaterOne had no new information that could be presented in a public hearing and ultimately used for the USACE to formulate its permitting decision. In fact, that is why WaterOne commented that the permit review be suspended. WaterOne is a public stakeholder in the Missouri River Bed Degradation Feasibility Study which is currently underway. The Study which identifies the causes and the future rate of degradation in the Kansas City area is not anticipated to be completed until 2017. It is WaterOne's belief that dredging in the Kansas City area is causing severe degradation and affecting WaterOne's public water utilities. Thus, WaterOne requested the issuance of the commercial dredging permits be suspended until more information is gathered from the Missouri River Bed Degradation Feasibility Study.

Due to the factors listed below, the USACE in a memorandum dated 7 October 2015 denied a Public Hearing for this project (Enclosure 14):

- The requester had presented no new information to be considered as part of the Corps public interest review of these actions.

- A public meeting was conducted on 26 August 2010 to discuss the Draft Environmental Impact Statement (EIS) on Missouri River commercial dredging. A court reporter was provided at the meeting to allow meeting attendees to submit oral comments. In addition, agencies, organizations, and interested parties provided written comments on the Draft EIS. In some cases, the Draft EIS was amended with updated or corrected information, and in some limited cases, additional analyses were required to adequately address the issue raised. Comments received during the Draft EIS comment process were considered in the preparation of a Final EIS. Not only did the Final EIS address all comments, but within the document, USACE identified and selected an environmentally preferred alternative that moderately reduced dredging overall in the Missouri River and significantly in the Kansas City Segment. It was determined the environmentally preferred alternative should not cause more than slight degradation in the short and long term and would balance all public interest facets (utilities, jobs, industry, etc.).

- NWK completed a Final EIS and Record of Decision (ROD) for Missouri River commercial dredging which thoroughly evaluated the impacts of the proposed action on the human environment and laid out a robust adaptive management framework to adjust permit conditions if the River was experiencing more than slight degradation. Results to date, demonstrate the ability to slow or stall localized degradation that stems from area intensive dredging using spatial and temporal extraction limits. This was clearly indicated in the KCD Engineering Division, River Engineering Section's (ED-HR) (Appendix 11) memo, dated 21 July 2015, which highlighted Missouri River bed and water surface changes between 2009 to 2014 in response to dredging and other river conditions. Analyses conducted by the ED-HR indicated aggradation or stability within each of the River's segments since 2011, with the exception of the St. Joseph segment. The St. Joseph segment continues to degrade despite limited sand and gravel extraction occurring in this reach. ED-HR concluded that the limited recovery of bed profiles in this segment can be attributed to the extreme high water event that occurred in 2011 and not to dredging (Appendix 11).

- WaterOne was the only Missouri River Stakeholder participating in the Missouri River Bed Degradation Feasibility Study to negatively comment and request a hearing on the proposed actions. In fact, WaterOne was the only stakeholder to ask the preliminary outputs of the Feasibility Study be incorporated in our 2016 permitting decision.

- Under the Feasibility study a Mobile Bed Model was developed to predict the long-term bed condition of the Missouri River given current and foreseeable system dynamics and variables. Although the Mobile Bed Model is nearing completion in 2015, it is undergoing various reviews and edits. Should the model be deemed finished in 2015, OD-R considers this to be preliminary information until the Feasibility Study is completed, which will analyze and evaluate the

various alternatives, based on the information predicted from the model. The completion of the Feasibility Study process will also allow for full public input on the model and its applications, which is occurring now and expected to be ongoing past the review period of this permit renewal.

- OD-R is privy to the progress of the Feasibility Study and its preliminary findings. OD-R will not consider preliminary outputs resulting from the developing bed degradation model in their permitting decision for Lower Missouri River Commercial Sand and Gravel Dredging renewal in 2015. Rather, OD-R will utilize its robust monitoring and Adaptive Management Framework (AMF) established as part of the Record of Decision (ROD). The AMF was set-up to measure river channel aggradation or degradation in relation to dredging activity and river conditions. This is accomplished by utilizing data from water surface profiles, prepared annually by the Corps, and hydro-acoustic bed elevation surveys, such as those prepared by the Corps and that are required by the Dredgers in the fourth year of each permit cycle. Data are compared against 2009 survey results to measure changes in water surface and bed profiles.

(2) The public **did not** provide comments at a non-Corps public hearing, meeting, and/or event. *Explain.* N/A

(3) Commentors and issues raised.

Name & Date	Issue
10 Form Letters Supporting All Missouri River Dredgers, Appendix 2 **15 Form Letters Supporting Holliday Sand and Gravel** , Appendix 2	Comments: Ten respondents provided comments generally supporting Missouri River Commercial Sand and Gravel Dredging and 15 respondents commented specifically endowing Holliday Sand and Gravel with their full support. Comments were not specific but generally iterated that dredging has occurred for years in the Missouri River, long before the USACE instituted the Bank Stabilization and Navigation Project, and is valuable to the economy of Kansas and Missouri and local communities. Response: The total economic effects of the proposed project include the direct, indirect, and induced economic impacts. As explained in Section 3.12 (Economics and Demographics) in the Final EIS, the indirect effects are generated by expenditures on goods and services needed to support ongoing dredging operations, the proportion of inputs that are procured locally, and inter-industry linkages throughout the state. The induced effects are associated with existing operation payrolls and

	labor earnings generated from indirect effects. The total ongoing benefits attributed to economic activity generated by the commercial dredging operations are substantial. According to the Final EIS (Section 3.12), in addition to the $33.3 million in the direct value of sand and gravel production, the statewide economy of Missouri realizes an additional $23.1 million in economic output annually attributed to the indirect and induced economic activity generated by dredging activities, for a total of $56.4 million in total output. Direct income benefits are supplemented by an additional $7.5 million in annual labor income throughout all industries in the state, for a total of $21.2 million in labor income benefits. Existing dredging also supports a total of 361 jobs throughout the state, which consist of direct employment at the existing operations (193 jobs) and another 168 jobs in other industries. At the industry level, the total economic benefits are driven primarily by economic activity in the services sector. Section 3.6 of the Final EIS describes the use of the Missouri River for commercial navigation. Although most of the commodity movements and tonnage shipped on the LOMR is associated with commercial dredging of sand and gravel by the permit applicants, other goods also are shipped along the river. Navigation benefits within the LOMR are provided primarily by the BSNP, which was designed and built to create and maintain a self-scouring navigation channel and for management of navigation flows by the USACE using storage in the upstream reservoir system. Directed by the United States Congress in 1912, the USACE began to construct the BSNP—a system of dikes to train and re-direct the river to an alignment engineered for the appropriate gradient for navigation and to prevent future channel movement; revetments to stabilize the banks; and other structures to direct flows in the LOMR, creating a self-scouring navigation channel. The BSNP structures were designed to direct river flows in order to prevent sediment accumulation in the main channel. The main goal of the BSNP was to provide a continuous open-river navigation channel, 9 feet deep and 300 feet wide, from Sioux City, Iowa to the Mississippi River—a distance of approximately 730 miles. The BSNP included substantial initial dredging; construction of over 2,000 dikes, revetments, and other structures; and shortening the river by closing off side oxbows and side

	channels. Maintenance of the BSNP continues in response to weathering and subsequent removal of rock from the tops of the dikes and revetments, and new structures occasionally built in response to changes in channel configuration. In general, the maintenance program is focused on maintaining the dikes at their design elevations based on the CRP (USACE 2009). See Section 3.4 for a more in-depth discussion of the CRP. Maintenance also requires reservoir releases and infrequent dredging activities by the USACE, particularly during periods of below-normal water supply. Maintenance dredging has been done on occasion during drought periods, mostly in downstream reaches. The BSNP continues to play an important role for navigation on the LOMR and must be accepted as a valid use by the dredgers. Together, with the proposed project, there is opportunity for the BSNP to fulfill its authorized purpose while permitting the safe and reasonable extraction of sand and gravel from the River.
Office of Congresswoman Vicky Hartzler, 6 April 2015, Appendix 2	Comment: The Congresswoman enthusiastically supports the re-issuance of Holliday Sand and Gravel's 2016 dredging permit because of the company's positive effects on the local economy. Response: As mentioned in the table above, the Corps performed a robust economics and demographics analysis in the Final EIS (Section 3.12). This analysis is current and remains pertinent for this permitting cycle because the Final EIS (Section 4.12) evaluated future economic-related effects associated with varying levels of sand and gravel production, such as the extraction totals proposed, from the LOMR. Ultimately, the Corps' final permitting decision will balance all public interest factors and will not be contrary to the public interest.
Office of Congressman Emanuel Cleaver, 2 April 2015, Appendix 2	Comment: The Congressman emphasized Holliday Sand and Gravel's important role in the Kansas City Metropolitan Area's economy. Specifically, the Congressman addressed the monetary benefits to local unions. Response: As mentioned in the table above, the Corps performed a robust

	economics and demographics analysis in the 2011 Final EIS (Section 3.12). This analysis is current and remains pertinent for this permitting cycle because the Final EIS (Section 4.12) evaluated future economic-related effects associated with varying levels of sand and gravel production, such as the extraction totals proposed, from the LOMR. Ultimately, the Corps' final permitting decision will balance all public interest factors and will not be contrary to the public interest. Comment: The Congressman encouraged the Corps to use its available flexibility in permitting the requested tonnages by Holliday Sand and Gravel, despite River bed degradation issues identified by the Feasibility Study. Response: OD-R is privy to the progress of the Feasibility Study and its preliminary findings. OD-R will not consider preliminary outputs resulting from the developing bed degradation model in their permitting decision for Lower Missouri River Commercial Sand and Gravel Dredging renewal in 2015. Rather, OD-R will utilize its robust monitoring and Adaptive Management Framework (AMF) established as part of the ROD. The AMF was set-up to measure river channel aggradation or degradation in relation to dredging activity and river conditions. This is accomplished by utilizing data from water surface profiles, prepared annually by the Corps, and hydro-acoustic bed elevation surveys, such as those prepared by the Corps and that are required by the Dredgers in the fourth year of each permit cycle. Data are compared against 2009 survey results to measure changes in water surface and bed profiles.
Office of Congressman Sam Graves, 30 March 2015, Appendix 2	Comment: The Congressman emphasized Holliday Sand and Gravel's important role in the Kansas City Metropolitan Area's economy. Specifically, the Congressman addressed the monetary benefits to local unions and the importance of quality sand provided by Holliday Sand and Gravel to the transportation industry. Response: As mentioned in the table above, the Corps performed a robust economics and demographics analysis in the 2011 Final EIS (Section 3.12). This analysis is current and remains pertinent

	for this permitting cycle because the Final EIS (Section 4.12) evaluated future economic-related effects associated with varying levels of sand and gravel production, such as the extraction totals proposed, from the LOMR. The Corps agrees with the Congressman that Missouri River Sand is a vital component to the region's infrastructure, especially the transportation industry. This importance was discussed heavily in Sections 3.6 (Navigation and Transportation) and 4.3 (Infrastructure) of the Final EIS. Ultimately, the Corps' final permitting decision will balance all public interest factors and will not be contrary to the public interest.
Holliday Sand and Gravel Company, Mike Odell, 2 April 2015, Appendix 2	Comment: We are anticipating a shortage of sand supplies as demand increases in the Kansas City Segment. These needs cannot be met with existing permitted tonnages or with a combination of in-river and off-river mining. Response: Holliday Sand and Gravel has provided no such evidence of a sand "shortage" in the Kansas City Metropolitan area that cannot be met from a combination of in-river and off-river mining, but the company appears to have addressed their claims by requesting increased tonnages in the Waverly Segment. The Final EIS acknowledged that market demands would likely increase over time and drew a positive correlation between sand and gravel need and population increases (Section 3.12.4) by stating "Population projections can provide insight about future demand for commercial sand and gravel in the region". Population projections for the primary market area through 2030 are shown in Table 3.12-3 of the Final EIS. Between 2000 and 2030, population was projected to grow by approximately 0.7 percent annually in the primary market area, increasing from approximately 4.8 million in 2000 to nearly 6.0 million by 2030. The Kansas City market area was expected to experience the greatest population growth of all Segments, increasing by approximately 1.2 percent annually during the 30-year projection period. Considering the projected growth of the region, the Final EIS concluded that sand and gravel production would shift in part from in-river dredging to alternate sources, for the short-term impacts under

	Alternative (A), the selected alternative. Existing dredging operations would incur direct economic losses over the long term in the form of lost revenues and profits at the firm level and lost income and jobs for employees. Estimated impacts include a loss of $23.0 million in economic output (or gross revenues), $9.7 million in labor income, and approximately 134 jobs. Although adverse economic impacts are associated with Alternative (A), these impacts would be partially offset at the industry level in the short term by direct economic benefits accruing to alternate mining operations currently in operation and their employees. In the long-term, these benefits would accrue to new mining operations developed in the region to offset the displaced supplies from the LOMR. Comment: Holliday continues to participate in the Missouri River Degradation Study and continues to attest dredging is not the root of the bed degradation issues in the LOMR. Holliday contests this is verified by the aggradation observed in the Kansas City and Waverly Segments between 2011-2014 even with a major flood event occurring in 2011. The market demand, beneficial effects on the local economy, and data that show aggradation led Holliday to request additional tonnage in the Waverly Segment. Response: As mentioned above, the Corps performed a robust economics and demographics analysis in the 2011 Final EIS (Section 3.12). This analysis is current and remains pertinent for this permitting cycle because the Final EIS (Section 4.12) evaluated future economic-related effects associated with varying levels of sand and gravel production, such as the extraction totals proposed, from the LOMR. Ultimately, the Corps' final permitting decision will balance all public interest factors and will not be contrary to the public interest. Hard and fast outputs stemming from the Feasibility Study are still forthcoming. Under the Feasibility Study a Mobile Bed Model was developed to predict the long-term bed condition of the Missouri River given current and foreseeable system dynamics and variables. Although the Mobile Bed Model is nearing completion in 2015, it is undergoing various reviews and edits. Should the model be deemed finished in 2015, OD-R considers this to be preliminary information until the Feasibility Study is completed, which will analyze and

	evaluate the various alternatives, based on the information predicted from the model. OD-R is privy to the progress of the Feasibility Study and its preliminary findings. OD-R will not consider preliminary outputs resulting from the developing bed degradation model in their permitting decision for Lower Missouri River Commercial Sand and Gravel Dredging renewal in 2015. Rather, OD-R will utilize its robust monitoring and Adaptive Management Framework (AMF) established as part of the ROD. The AMF was set-up to measure river channel aggradation or degradation in relation to dredging activity and river conditions. This is accomplished by utilizing data from water surface profiles, prepared annually by the Corps, and hydro-acoustic bed elevation surveys, such as those prepared by the Corps and that are required by the Dredgers in the fourth year of each permit cycle. Data are compared against 2009 survey results to measure changes in water surface and bed profiles. The Corps will consider changes to extraction totals as they align with the following: Data from the first four years of the permitting cycle will be compared with the 2009 water surface profile and bed elevation baselines to evaluate if the permit limits and special conditions adequately limited the impact of dredging to no more than slight degradation across the river as projected by the 2011 Final EIS. Trends of moderate to severe degradation instead of the slight degradation anticipated by the Final EIS for the Environmentally Preferred Alternatives for the St. Joseph, Waverly, Jefferson City, and St. Charles segments or any additional degradation in the Kansas City segment would require a thorough review of the permit provisions and could result in reductions in authorized dredging reaches or quantities, or implementation of other mitigation measures in the new permit decision. Likewise, aggradation trends could allow for consideration of increased quantities.
Capital Sand and Gravel, Steve Bohlken, 2 April 2015, Appendix 2	Comment: The bed of the Missouri River is owned by citizens of Missouri. Restrictions on tonnage deny the citizens of Missouri access to their assets and to the use and utilization of their owned resources Response: The Missouri River has dozens of uses; not all of which center around mining activities. The Corps' final decision for this

	permit will be based on a multitude of factors and will ultimately conclude that our decision is not contrary to the "overall" public interest. Comments: Restrictions on the amount of sand mined by Capital Sand should be relaxed in favor of greater tonnage, or at a minimum be maintained at 2011 permitted levels. Additionally, adequate sand resources exist in the St. Charles Segment to facilitate bed recovery potentially stemming from the additional requested tonnage in this segment. Response: OD-R will utilize its robust monitoring and Adaptive Management Framework (AMF) established as part of the 2011 ROD. The AMF was set-up to measure river channel aggradation or degradation in relation to dredging activity and river conditions. This is accomplished by utilizing data from water surface profiles, prepared annually by the Corps, and hydro-acoustic bed elevation surveys, such as those prepared by the Corps and that are required by the Dredgers in the fourth year of each permit cycle. Data are compared against 2009 survey results to measure changes in water surface and bed profiles. The Corps will consider changes to extraction totals as they align with the following: Data from the first four years of the permitting cycle will be compared with the 2009 water surface profile and bed elevation baselines to evaluate if the permit limits and special conditions adequately limited the impact of dredging to no more than slight degradation across the river as projected by the 2011 Final EIS. Trends of moderate to severe degradation instead of the slight degradation anticipated by the Final EIS for the Environmentally Preferred Alternatives for the St. Joseph, Waverly, Jefferson City, and St. Charles segments or any additional degradation in the Kansas City segment would require a thorough review of the permit provisions and could result in reductions in authorized dredging reaches or quantities, or implementation of other mitigation measures in the new permit decision. Likewise, aggradation trends could allow for consideration of increased quantities. Comment: Tonnages should be fairly distributed among companies and their historic presence on the River. Response: The Corps determined in the 2011 Final EIS that there were six companies that had a vested interest in

	commercial sand and gravel mining on the Missouri River. These companies were issued permits based on requested tonnages and extraction alternatives (based on bed loads at below average and normal flows) that would lead to no more than slight degradation over the short and long term. The 2016 permit renewal will evaluate the proposed action along the same lines. Tonnages will be allocated according to each applicants' requested extraction totals and whether the requested tonnages would represent a percentage of bed load that would sustain a "no more than slight degradation" standard.
Gateway Dredging, Brian Viehmann, 26 March 2015, Appendix 2	Comment: Gateway dredging supports the re-issuance of Jotori and Limited Leasing's 2016 dredging permits because of the companies' positive reputation and their beneficial effects on the local economy. Response: As mentioned in the table above, the Corps performed a robust economics and demographics analysis in the 2011 Final EIS (Section 3.12). This analysis is current and remains pertinent for this permitting cycle. Ultimately, the Corps' final permitting decision will balance all public interest factors and will not be contrary to the public interest.
Richard Geekie, 3 April 2015, Appendix 2	Comment: "...dredging does not cause a nick point and therefore does not cause head cutting. A preliminary investigation demonstrated this, however, the "test period" was only about two weeks. Further investigation over a longer period is required to confirm this result during extended periods of dredging." Response: The Final EIS concluded that localized dredging occurring in an intensive fashion may cause local degradation and may be one of the many contributors affecting the overall degradation trend of the Missouri River. ED-HR and OD-R are vigilantly monitoring the degradations trends and will adjust dredging permits as is necessary to not exacerbate headcutting. Comment: "The constriction of the floodplain at river mile (RM) 374.1 (I-435 Bridge) and also the constriction of the floodplain on the south end of the airport have caused most of the degradation."

	Response: Because this permit action pertains to commercial dredging, our NEPA documentation will be focused on commercial dredging activities and their relationship with degradation. The Final EIS utilized available information to assess impacts from other potential causes of river bed degradation, but it did not extensively study the source of the other causes. OD-R will not force the dredgers' to determine the cause or potential solutions of widespread bed degradation in the Missouri River. OD-R has previously determined our scope on this subject to be limited to bed degradation that is caused by or is exacerbated by our regulatory action. Comments: "It may be possible that dredging has contributed to channel degradation in the KC reach during the drought of 2000 to May 2007 because little bed-material load was coming from upstream." "The channel degradation in KC reach has appeared to stop since about 2007 (the end of the drought) and the channel upstream and downstream of the Kansas River has rebounded, that is, aggradation has occurred, even during significant amounts dredging in the KC reach." Response: At the time of the 2011 Final EIS, the Kansas City segment had shown a substantial amount of river bed degradation from the previous 20 years, leading to substantial impacts on infrastructure and environmental resources that would continue to be at risk should dredging not be reduced. Thus, the USACE limited dredging in the Kansas City segment 540,000 tons per year. Dredging at this reduced level was expected to reduce degradation to the "slight degradation to slight aggradation" category in the short term and long term. Additionally, the USACE developed a monitoring plan to detect if the permitted dredging was leading to or significantly contributing to widespread degradation. Response: OD-R will utilizes a monitoring and Adaptive Management Framework (AMF), established as part of the ROD. The AMF was set-up to measure river channel aggradation or degradation in relation to dredging activity and river conditions. This is

	accomplished by utilizing data from water surface profiles, prepared annually by the Corps, and hydro-acoustic bed elevation surveys, such as those prepared by the Corps and that are required by the Dredgers in the fourth year of each permit cycle. Data are compared against 2009 survey results to measure changes in water surface and bed profiles. OD-R has worked closely with our district ED-HR to interpret data resulting from Corps surveys and surveys conducted as part of the dredging AMF. The results are incorporated into this permitting decision. The authorized tonnages should not cause more than slight degradation across all River segments in the short and long term. Because this permit action pertains to commercial dredging, our NEPA documentation will be focused on commercial dredging activities and their relationship with degradation. The Final EIS utilized available information to assess impacts from other potential causes of river bed degradation, but it did not extensively study the source of the other causes. OD-R will not force the dredgers' to determine the cause or potential solutions of widespread bed degradation in the Missouri River. OD-R has previously determined our scope on this subject to be limited to bed degradation that is caused by or is exacerbated by our regulatory action. Comment: "The sills upstream of the I-435 Bridge may also have and still contribute to head cutting upstream of the Bridge." Response: Because this permit action pertains to commercial dredging, our NEPA documentation will be focused on commercial dredging activities and their relationship with degradation. The Final EIS utilized available information to assess impacts from other potential causes of river bed degradation, but it did not extensively study the source of the other causes. OD-R will not force the dredgers' to determine the cause or potential solutions of widespread bed degradation in the Missouri River. OD-R has previously determined our scope on this subject to be limited to bed degradation that is caused by or is exacerbated by our regulatory action.
Lathrop and Gage, David Shorr, 6 April 2015,	Comment: Mr. Shorr emphasized the Dredger's important role in the

Appendix 2	Kansas and Missouri economies and the importance of quality and quantity of sand that they provide. Response: As mentioned in the table above, the Corps performed a robust economics and demographics analysis in the 2011 Final EIS (Section 3.12) This analysis is current and remains pertinent for this permitting cycle. The Corps agrees with Mr. Shorr that Missouri River Sand is a vital component to the region's infrastructure, especially the transportation industry. This importance was discussed heavily in Sections 3.6 (Navigation and Transportation) and 4.3 (Infrastructure) of the Final EIS. Ultimately, the Corps' final permitting decision will balance all public interest factors and will not be contrary to the public interest. Comment: The bed of the Missouri River is owned by citizens of Kansas and Missouri. Restrictions on tonnage deny the citizens of Kansas and Missouri access to their assets and to the use and utilization of their owned resources. Response: The Missouri River has dozens of uses; not all of which center around mining activities. The Corps' final decision for this permit will be based on a multitude of factors and will ultimately conclude that our decision is not contrary to the "overall" public interest. Comments: Restrictions on the amount of sand mined by the dredgers should be relaxed in favor of greater tonnage. Response: OD-R will utilize its robust monitoring and Adaptive Management Framework (AMF) established as part of the 2011 ROD. The AMF was set-up to measure river channel aggradation or degradation in relation to dredging activity and river conditions. This is accomplished by utilizing data from water surface profiles, prepared annually by the Corps, and hydro-acoustic bed elevation surveys, such as those prepared by the Corps and that are required by the Dredgers in the fourth year of each permit cycle. Data are compared against

	2009 survey results to measure changes in water surface and bed profiles. The Corps will consider changes to extraction totals as they align with the following: Data from the first four years of the permitting cycle will be compared with the 2009 water surface profile and bed elevation baselines to evaluate if the permit limits and special conditions adequately limited the impact of dredging to no more than slight degradation across the river as projected by the 2011 Final EIS. Trends of moderate to severe degradation instead of the slight degradation anticipated by the Final EIS for the Environmentally Preferred Alternatives for the St. Joseph, Waverly, Jefferson City, and St. Charles segments or any additional degradation in the Kansas City segment would require a thorough review of the permit provisions and could result in reductions in authorized dredging reaches or quantities, or implementation of other mitigation measures in the new permit decision. Likewise, aggradation trends could allow for consideration of increased quantities. Comment: Previous permits have taken steps to contain the issue of bed degradation. It remains the position of the Dredgers Group that the major causes of bed degradation are the containment of sediment behind the dams in the Upper Missouri River and failure to properly and adequately maintain training structures as part of the BSNP. Response: Because this permit action pertains to commercial dredging, our NEPA documentation will be focused on commercial dredging activities and their relationship with degradation. The Final EIS utilized available information to assess impacts from other potential causes of river bed degradation, but it did not extensively study the source of the other causes. OD-R will not force the dredgers' to determine the cause or potential solutions of widespread bed degradation in the Missouri River. OD-R has previously determined our scope on this subject to be limited to bed degradation that is caused by or is exacerbated by our regulatory action. The Final EIS concluded that localized dredging occurring in an intensive fashion may cause local degradation and may be one of the many contributors affecting the overall degradation trend of the Missouri River. The ED-HR and OD-R are

	vigilantly monitoring the degradations trends and will adjust dredging permits as is necessary to not exacerbate headcutting. Hard and fast outputs stemming from the Feasibility Study are still forthcoming. Under the Feasibility study a Mobile Bed Model was developed to predict the long-term bed condition of the Missouri River given current and foreseeable system dynamics and variables. Although the Mobile Bed Model is nearing completion in 2015, it is undergoing various reviews and edits. Should the model be deemed finished in 2015, OD-R considers this to be preliminary information until the Feasibility Study is completed, which will analyze and evaluate the various alternatives, based on the information predicted from the model. OD-R is privy to the progress of the Feasibility Study and its preliminary findings. OD-R will not consider preliminary outputs resulting from the developing bed degradation model in their permitting decision for Lower Missouri River Commercial Sand and Gravel Dredging renewal in 2015. Rather, OD-R will utilize its robust monitoring and Adaptive Management Framework (AMF) established as part of the ROD. The AMF was set-up to measure river channel aggradation or degradation in relation to dredging activity and river conditions. This is accomplished by utilizing data from water surface profiles, prepared annually by the Corps, and hydro-acoustic bed elevation surveys, such as those prepared by the Corps and that are required by the Dredgers in the fourth year of each permit cycle. Data are compared against 2009 survey results to measure changes in water surface and bed profiles.
WaterOne, Darci Meese, 2 April 2015, Appendix 2	Comment: WaterOne requested a formal public hearing on this matter. They believe the widespread impact on public and private infrastructure rendered by commercial sand dredging on the Missouri River warrants the most open of public forums to collect input. Response: A public meeting was conducted on 26 August 2010 to discuss the Draft Environmental Impact Statement (EIS) on Missouri River commercial dredging. A court reporter was provided at the meeting to allow meeting attendees to submit oral

	comments. In addition, agencies, organizations, and interested parties provided written comments on the Draft EIS. In some cases, the Draft EIS was amended with updated or corrected information, and in some limited cases, additional analyses were required to adequately address the issue raised. Comments received during the Draft EIS comment process were considered in the preparation of a Final EIS. Not only did the Final EIS address all comments, but within the document, USACE identified and selected an environmentally preferred alternative that moderately reduced dredging overall in the Missouri River and significantly in the Kansas City Segment. It was determined the environmentally preferred alternative should not cause more than slight degradation in the short and long term and would balance all public interest facets (utilities, jobs, industry, etc.). WaterOne was the only Missouri River Stakeholder participating in the Missouri River Bed Degradation Feasibility Study to negatively comment and request a hearing on the proposed actions. In fact, WaterOne was the only stakeholder to ask the preliminary outputs of the Feasibility Study be incorporated in our 2016 permitting decision. Significant public involvement has already occurred for the proposed actions and continues to be underway on the issues WaterOne identified. Additionally, no new information was presented by WaterOne to justify a public hearing. The request for a public hearing was denied by the Kansas City District Commander on 7 October 2015. Comment: WaterOne requested USACE suspend commercial dredging permits until the completion of the Feasibility Study. Response: Hard and fast outputs stemming from the Feasibility Study are still forthcoming. Under the Feasibility study a Mobile Bed Model was developed to predict the long-term bed condition of the Missouri River given current and foreseeable system dynamics and variables. Although the Mobile Bed Model is nearing completion in 2015, it is undergoing various reviews and edits. Should the model be deemed finished in 2015, OD-R considers this to be preliminary information until the Feasibility Study is completed, which will analyze and evaluate the various alternatives, based on the information

	predicted from the model. OD-R is privy to the progress of the Feasibility Study and its preliminary findings. OD-R will not consider preliminary outputs resulting from the developing bed degradation model in their permitting decision for Lower Missouri River Commercial Sand and Gravel Dredging renewal in 2015. Rather, OD-R will utilize its robust monitoring and Adaptive Management Framework (AMF) established as part of the ROD. The AMF was set-up to measure river channel aggradation or degradation in relation to dredging activity and river conditions. This is accomplished by utilizing data from water surface profiles, prepared annually by the Corps, and hydro-acoustic bed elevation surveys, such as those prepared by the Corps and that are required by the Dredgers in the fourth year of each permit cycle. Data are compared against 2009 survey results to measure changes in water surface and bed profiles.
Missouri Department of Transportation, 30 March 2015, Appendix 2	Comment: To promote the health of Missouri's infrastructure and safety to the travelling public, Missouri Department of Transportation (MODOT) requests that dredging not be allowed within 1000 feet of any bridge pier or abutment as opposed to the 500 foot limit in the last permitting cycle. Response: The USACE will not implement this recommendation. No evidence exists to suggest that dredging exacerbates scouring around bridge piers and/or abutments (within 500 feet). MODOT presented no new evidence that dredging was causing scour near its infrastructure. According to a telephone conversation with Dennis Heckman on 5 October 2015 the recommendation stemmed from one isolated incident in the Jefferson City Segment near MRM 144 where excessive scour led to a $2 million repair of a bridge pier. Coincidently, the scour is located adjacent to a processing plant for a dredging company. Excessive scour cannot be affirmably attributed to dredging within 500 feet of the structure. Missouri DOT presented no evidence that dredging within 500-999 feet of their structure was exacerbating bridge scour and/or an increased buffer would prevent scour. Even in river systems with no dredging, significant scouring can and is well known issue that occurs on

	the downstream side of a bridge pier or abutment. The 2011 ROD in Section 6.1.2.1 identifies several scenarios where a 500 foot setback would be an appropriate buffer to protect infrastructure. For the reasons listed above there is not enough evidence to support a blanket condition that increases a no-dredging buffer around MODOT's infrastructure to justify the additional financial and logistical hardship it would place upon the Dredgers.
United States Environmental Protection Agency (USEPA), Jason Daniels, 2 April 2015, Appendix 3	Comment: ROD Cumulative Dredging Allowed/Proposed: 2016 5,880,000/5,730,000 t/year under allowable 2017 5,880,000/5,807,000 t/year under allowable 2018 5,880,000/5,884,000 t/year over allowable 2019 5,880,000/5,961,000 t/year over allowable 2020 5,880,000/6,038,000 t/year over allowable The USEPA continues to urge the Corps to develop a sediment budget for the Missouri River. Response: The USEPA has misinterpreted the proposed action, past levels of permitted dredging on the LOMR, and the overall framework managing dredging on the LOMR. The Final EIS and ROD did not place a cap on cumulative dredging on the entire LOMR, rather, it evaluated a range of alternatives based on bed material loads at differing river stages for each segment. USACE's ROD did not conclude that 5,880,000 tons was the maximum allowable tonnage the LOMR could sustain before moderate degradation occurred. The ROD identified the Environmentally Preferred Alternative which balanced all public interest factors against current river trends. As part of the AMF, the applicants can request additional tonnages. The increases may be authorized if River trends indicate bed aggradation. Ideally, the proposed increases would fall within the range of alternatives analyzed in the Final EIS. The USEPA appears to be drawing attention to the fact that the requested tonnages in the Waverly Segment fall outside of the range of the alternatives analyzed in the Final EIS. This is true and the Corps has prepared an EA (Appendix 7) to evaluate if the proposed tonnages meet the LEDPA criteria and are not contrary to the public interest.

	The USEPA's statements that claim the proposed action exceeds the "maximum allowable tonnage identified in the ROD for the LOMR" are not in keeping with the management framework or the USACE's evaluation criteria to determine if the increases should be authorized. Essentially, the USACE has established a type of sediment budget for dredging on the Missouri River. Extraction totals are all based on bed loads, only permitting sustainable levels that should not result in more than slight degradation in the short and long term. Comments: The USEPA is concerned that permitting increases above 2011 permitted levels in the Waverly segment could alter a stable and aggrading segment into a degrading segment. Two applicants are requesting the same quantity and Hermann is proposing a 30,000 t/year increase over its previous permitted quantity and above the allowable quantity for the segment. This segment is considered to be degrading in certain reaches. The Corps should provide recently collected data which indicates both that the segment can support an overall increase in dredging and that those individual reaches can sustain that increase locally. The St. Charles segment is considered a degraded segment and the 2011 ROD allowed for continuing dredging slightly above the quantities previously harvested. We have serious concerns with permitting increased amounts of dredged material removal from this segment. Response: The Corps understands the USEPA's concern but the USEPA has presented no data to validate their concerns or claims. With the help of ED-HR, OD-R continues to monitor the bed trends of the Missouri River. Water surface profiles are collected yearly and a hydro-acoustic bed survey is conducted on the fourth year of every permitting cycle. These data are compared against baseline data from 2009 to help identify degradation or aggradation trends. Results to date, demonstrate the ability to slow or stall localized degradation that stems from area intensive dredging using spatial and temporal extraction limits. This was clearly

	indicated in a memo from ED-HR (Appendix 11) which highlighted Missouri River bed and water surface changes between 2009 to 2014 in response to dredging and other river conditions. Analyses conducted by ED-HR indicated aggradation or stability within each of the River's segments since 2011, with the exception of the St. Joseph segment. The St. Joseph segment continues to degrade despite limited sand and gravel extraction occurring in this reach. ED-HR concluded that the limited recovery of bed profiles in this segment can be attributed to the extreme high water event that occurred in 2011 and not to dredging. The results were used to inform OD-R of the proper permitting path forward while considering the requested increases within the respected segments. The OD-R holds firm that our AMF is capable of measuring bed trends as they occur and will not jump to conclusory statements without the appropriate data. Because this permit action pertains to commercial dredging, our NEPA documentation will be focused on commercial dredging activities and their relationship with degradation. The Final EIS utilized available information to assess impacts from other potential causes of river bed degradation, but it did not extensively study the source of the other causes. OD-R will not force the dredgers' to determine the cause or potential solutions of widespread bed degradation in the Missouri River. OD-R has previously determined our scope on this subject to be limited to bed degradation that is caused by or is exacerbated by our regulatory action. Comment: We do not believe there is justification for increases in permitted dredging quantities above those levels allowable under the 2011 ROD. The Environmental Assessment supporting this action and tiering from the 2011 Final EIS would have to demonstrate no significant impact to these segments from any such increases. Otherwise, a supplemental EIS would have to be prepared. We continue to urge the Corps to develop a sediment budget for the lower Missouri River which could serve as the basis for firmly identifying levels of dredging which are sustainable and would not contribute to continuing bed and habitat degradation in the lower river. Response: The USEPA has presented no data to validate their concerns or claims. With the help of ED-HR, OD-R continues to monitor

	the bed trends of the Missouri River. Water surface profiles are collected yearly and a hydro-acoustic bed survey is conducted on the fourth year of every permitting cycle. These data are compared against baseline data from 2009 to help identify degradation or aggradation trends. The Corps has prepared an EA (Appendix 7) to evaluate if the proposed tonnages meet the LEDPA criteria and are not contrary to the public interest. Comment: At this point the sequencing requirements under the 404(b)(1) Guidelines have not been met as the range of alternatives is incomplete. The applicant must provide an alternatives analysis and describe any additional alternatives for the proposed project. Alternatives should include and compare dredging less quantity, setting maximum depth limits, using different dredging techniques, and various processing methods. Investigating different locations, including off river locations should be considered as part of the analysis. An evaluation of the direct, secondary and cumulative impacts for practicable alternatives should be provided. Potential indirect effects that may result from increased river bed degradation related to dredging include erosion, induced. Response: Sections 5 and 6 of the 2011 ROD and the Supplemental EA describe the evaluation criteria and analysis determining the permitted action is the LEDPA. Generally these criteria did not change for the 2016 permit renewals because no increases were authorized outside the Waverly Segment. The proposed increases in the Waverly Segment were evaluated in an EA (Sections 3 and 4) (Appendix 7) that concluded in a Finding of No Significant Impact (FONSI) and a LEDPA determination. The LEDPA includes annual extraction limits for each segment based on the estimated sediment load of each segment and/or recent average extraction limits, limits on localized dredging intensity for the most degraded and heavily dredged five-mile reaches, and a monitoring and adaptive management framework and is expected to result in no more than a slight amount of degradation or aggradation in the short and long term. See Section 4.2 and 4.5 of the Final EIS (USACE 2011) and Sections 3 and 4 of the EA for additional information.

	Cumulative and secondary impacts are discussed in Chapter 5 of the Final EIS, Section 4.2.2 of the ROD, and the EA (Appendix 7). No significant cumulative, indirect or secondary impacts not already addressed in the Final EIS are expected to result from authorization of the LEDPA in this Combined Decision Document. Comment: The proposed projects could cause or contribute to violations of state water quality standards; or contribute to the violation of toxic effluent standards under Section 307 of the Clean Water Act, or further degrade water quality. Response: The Missouri Department of Natural Resources and the Kansas Department of Health and Environment certified in accordance with Section 401 of the CWA (33 U.S.C.§1341), that the work would not violate applicable water quality standards (Appendix 4). These certifications contain several conditions which address water quality concerns. The applicants will be informed by the proposed permit transmittal letters that the conditions presented in the certifications are incorporated into the special conditions of the Department of the Army permit by reference, as stated in General Condition "5" of the permit document. As discussed in Section 3.7 of the Final EIS (USACE 2011), state water quality standards for turbidity and suspended sediment in the LOMR are largely qualitative, and it is important to note that sediment levels in the LOMR have decreased substantially from historical levels due to the installation of dams and the associated flow modifications, bank stabilization, and the design of the navigation channel. Any suspended sediment from the hydraulic dredge head would be limited to the bottom of the water column. Large-particle sediments from the dredge discharges would quickly settle to the bottom of the LOMR; and the fine sediments discharged, depending upon background levels at the time of discharge, may contrast with receiving waters. But fine sediment discharge would likely not be of sufficient quantity to differ substantially from the maximum natural suspended sediment levels in receiving waters. See Section 4.5 of the Final EIS (USACE 2011) for additional information. Comment:

	The project could jeopardize the continued existence of habitat for state and federally listed endangered species. Response: The USACE has worked closely with the USFWS to prepare an updated Biological Assessment (BA) (Appendix 5) with the appropriate determination of effects for the proposed action. The updated BA contains the most recent scientific information regarding the pallid sturgeon, especially the larval life cycle stage, and incorporates findings from the 2014 and 2015 Habitat Assessment Monitoring Plan. The USACE submitted a Final BA on 30 October 2015 and the USFWS concurred on 20 November 2015 (Appendix 12) that the proposed action was not likely to adversely affect listed species in the action area. Comment: USEPA has concerns regarding signification degradation as determined through Guidelines subparts C through F (40 CFR 230.20 – 230.54). The Guidelines prohibit granting of a CWA Section 404 permit if project activities will cause or contribute to significant degradation of the Nation's waters including degradation to: (1) human health and welfare; (2) aquatic life and other wildlife: (3) aquatic ecosystem diversity, productivity, and stability; and (4) recreation, aesthetic, and economic values. Response: The Corps has previously evaluated the effects of commercial dredging on the Lower Missouri River to the factors in Subparts C-F. This evaluation was well documented in Sections 5.1-5.4 of the ROD. Increased authorized 2016 extraction totals do not differ from the 2011 extraction totals in four of the five River Segments thus no substantial evaluation is needed. However, the Corps will evaluate the increased tonnages that were authorized in the Waverly Segment; this can be found in the Corps' EA attached as an appendix to this decision document (Appendix 7). Comment: The USEPA has concerns regarding avoidance, minimization, and compensation. As identified in the "Alternatives Analysis" section above there are additional opportunities for avoidance and minimization. The applicant has not demonstrated that impacts have been fully minimized. The USEPA also has

	concerns regarding the lack of identification of the LEDPA. No mitigation was proposed in the public notice, however a link to the EIS discusses options for mitigation that could be used. Response: The USACE has determined that avoidance and minimization measures required as special conditions of this permit offer an adequate amount of mitigation for the affects to the resource. These mitigation measures amply protect important and sensitive areas of the River and have proved to be adequate at stabilizing or aggrading degraded River reaches without causing undo financial hardship on the dredgers. Further, there is no permanent loss of aquatic habitat resulting from the authorized action, thus no compensatory mitigation will be sought.
United States Fish and Wildlife Service (USFWS), Jane Ledwin, 3 April 2015, Appendix 3	Comment: Since the 2011 BA, there has been significant new information regarding pallid sturgeon population status, larval ecology (e.g., drift distance and location), and conditions/monitoring of the river itself. In addition, "new" permit conditions and monitoring have been in place for five years, providing a wealth of information on the effects of the proposed activities not available for the 2011 BA. Therefore, the Corps should update that document to include new information on the species, ecology, behavior of larvae, occurrence of young-of-year habitats, etc. Furthermore, the Corps should review the information being developed as part of the effects analyses effort for the Missouri River Management Plan, including review of pallid sturgeon literature and prevailing hypotheses, to help relate the new information to the potential effects of the propose activities. That should also include information regarding behavior of the dredged areas geomorphologically, changes in bed elevations and stability of adjacent habitats, and projections of bed degradation/aggradation relative to those habitats. Those effects should be analyses for all life stages of the pallid sturgeon; adults, juveniles, larvae, eggs (e.g., size/sorting of material handled and suitability for spawning). The Service is available to meet with the Corps to discuss revisions to the BA and relevant issues if needed. Response:

	The USACE has worked closely with the USFWS to prepare an updated BA (Appendix 5) with the appropriate determination of effects for the proposed action. The updated BA contains the most recent scientific information regarding the pallid sturgeon, especially the larval life cycle stage, and incorporates findings from the 2014 and 2015 Habitat Assessment Monitoring Plan. The USACE submitted a Final BA on 30 October 2015 and the USFWS concurred 20 November 2015 (Appendix 12) that the proposed action was not likely to adversely affect listed species in the action area.
Missouri Department of Natural Resources, Christopher Miller, 19 March 2015, Appendix 3	Comment: Unwanted dredged material and river water extracted from only the river may be placed back into the river. The applicant should not dispose of waste materials, water, or garbage below the ordinary high water mark of any other water body, in a wetland area, or at any location where the materials could be introduced into the water body or an adjacent wetland as a result of runoff, flooding, wind, or other natural forces. Response: This comment has previously been and will continue to be addressed in the special conditions of commercial dredging permits on the LOMR. Comments: All dredging must avoid impacting aquatic habitat, particularly breeding and rearing areas of endangered, rare, or threatened species and mussel beds. Response: This comment has previously been and will continue to be addressed in the special conditions of commercial dredging permits on the LOMR as it pertains to federally protected species. Comment: Operations in the river should be conducted such that there will be no unreasonable interference with navigation by the existence or use of the activity. Response: This comment has previously been and will continue to be addressed in the special conditions of commercial dredging permits on the LOMR.

	Comment: Project activities should not accelerate bed or bank erosion. Response: This comment has previously been and will continue to be addressed in the special conditions of commercial dredging permits on the LOMR. Comment: Quality of downstream water supplies should not be adversely affected by this project. Any such supplies in the immediate downstream river miles should be advised at the time the project is initiated. Response: This comment has previously been and will continue to be addressed in the special conditions of commercial dredging permits on the LOMR. Comment: Sand, gravel, or other dredged materials should not be stockpiled within the channel, placed against the banks, or otherwise disposed of in a manner that will redirect erosive forces within the channel, or threaten the stability of the channel or the bank lines. Response: This comment has previously been and will continue to be addressed in the special conditions of commercial dredging permits on the LOMR.

(4) The sites have previously been visited by the Corps to obtain information in addition to delineating jurisdiction.

(5) Issues identified by the Corps.

- ED-HR performed an analysis of dredging volumes and locations, bed surveys, and water surface profiles from 2011-2014, compared to baseline data. The results were provided in a memo to the OD-R on 14 July 2015 (Appendix 11). Principally, the memo drew attention to the degradation occurring in the St. Joseph segment but did not appear to be spatially associated with dredging activity. Preliminary results were presented in person to the Dredgers on 7 July

2015 by OD-R and ED-HR. A scanned, electronic copy of the memo was provided to the Dredgers on 15 July 2015.

- Engineering Division (ED) provided two memos to OD-R on 10 November 2015 (Appendix 6). Within the memos the ED made four recommendations for the re-issuance of Missouri River commercial dredging permits in 2016. The recommendations were as follows:

1) ED recommends that the permitted tonnage be significantly reduced or dredging suspended in the St. Joseph Segment. This recommendation is based on bathymetric monitoring data required in 2011 ROD, which shows (1) More than slight degradation has occurred in the St. Joseph Segment, even at an average dredging level of 20% of the currently permitted amount, (2) Bed changes in some 5-mile reaches exceeded even the long term maximum prediction in the EIS of 4ft, and (3) Degradation has migrated upstream towards the St. Joseph urban area.

   Discussion: OD-R will evaluate lower alternatives, such as Alternatives [A] and [C] within the Final EIS, to address the degradation observed in the St. Joseph Segment. Alternatives [A] and [C] adequately address ED's concerns as they represent a "worst-case" scenario from bed material load standpoint and the average extraction of the segment, respectively. OD-R will also take into consideration appropriate minimization measures, such as not permitting dredging, in the most degraded reaches.

2) ED recommends that the tonnage be maintained at the currently permitted level in the Waverly Segment, which represents a 183% increase over the average dredged from 2011-2015. The rationale for this recommendation is (1) Observed aggradataion is very slight, (2) 1,140,000 tons/year is the upper bound of dredging analyzed in the EIS, (3) The actual dredged amount from 2011 to 2015 was 55% of the authorized amount, which provides insufficient empirical evidence to correlate the 2009 to 2014 bed response to dredging levels above (or even at) the 2011-2015 authorized levels.

   Discussion: OD-R understands that the amount of tonnage requested for the Waverly Segment is higher than the highest alternative considered in the Final EIS. However, in keeping with the Adaptive Management Framework within the Final EIS, OD-R will consider the additional tonnage requested in the Segment. The Waverly Segment is believed to have been aggrading since 1998 and this was affirmed by bathymetric data collected in 2014. We have prepared an EA to evaluate the effects of the requested increase in dredging and it is attached to this decision document (Appendix 7).

   It is also worth noting that the 2011 ROD incentivized the Dredger's to not remove and stockpile unneeded permitted sand by allowing up to 10% of their

unused authorized tonnage to be carried over from the previous year. To now penalize the dredgers for not removing all their permitted tonnage between 2011 and 2014 would create regulatory uncertainty and could encourage extractions and impacts above those prompted by the market demands and the public interest.

3) ED recommends that river miles that have experienced more than 2 feet of degradation since 2009 be closed to dredging in order to increase the likelihood of bed recovery. The data collected at the end of each permit cycle will provide insight into the long-term bed trends in these reaches.

   Discussion: In keeping with the Adaptive Management Framework in the 2011 ROD, OD-R will evaluate the use of restrictive dredging in areas that have experienced more than the predicted amount of degradation under the Final EIS. OD-R sees the need to address recent River trends, in the appropriate context, and agrees that dredging curtailment may be needed in some scenarios where the dredging is causing or exacerbating bed degradation.

4) ED recommends that sustainable dredging levels be considered when permitting dredging amounts for this permit cycle and future permit cycles and the analysis within ED Memo "A Sediment Budget Approach to Stable Dredging Levels on the Missouri River, 1994 to 2014 –October 2015" be updated for each future permit renewal. Sustainable dredging levels will allow for an overall stable river bed and provide more certainty of permitted quantities between permit cycles by reducing the likelihood that extracted volumes cause degradation that necessitate reductions in permitted dredging levels.

   The October 2015 Memo presented a river-wide analysis that suggested a stable extraction rate for the Missouri River from 1994 to 2014 was 2.4 million tons/year.

   Discussion: Due to the length of the river being considered for dredging permits, a means of dividing the river into manageable units was needed for the Final EIS. The LOMR from Rulo, Nebraska to St. Louis, Missouri includes diverse environmental conditions and considerable variations in land uses encompassing rural and urban areas. In addition, there is considerable variation in historical dredging operations and in supply from major tributaries. Finally, there are limited locations where sufficient hydrologic and sediment data have been collected to allow computation of sediment bed load estimates.

   Of primary importance in evaluating Missouri River commercial dredging is the potential for contributing to or exacerbating river bed degradation and how that degradation may affect various aspects of the natural and human environment. The two most important factors for segmenting the LOMR were

(1) the limited number of locations where data are available to calculate sediment loads in the river; and (2) the number and location of major tributaries contributing additional sediment load to the river. Segment boundaries were established at major tributaries: Kansas River (RM 367.5), Grand River (RM 249.9), and Osage River (RM 129.9). Physical parameters such as bedrock geology, slope breaks, tributaries, width of the alluvial floodplain, and USGS gage locations were reviewed to refine the segment boundaries.

During the river segmentation process, it was recognized that the confluence of the Kansas and Missouri Rivers at Kansas City created a special circumstance. The Kansas River joins the LOMR in the heart of Kansas City, bisecting both the urbanized area and the area with the most observed channel degradation within the Project area. To better analyze issues specific to the Kansas City area, an additional segment was created by selecting tributaries upstream and downstream from the Kansas River, creating the Kansas City segment. The upstream tributary is the Platte River (Missouri) at RM 391.1, and the downstream tributary is the Big Blue River at RM 356.9.

Five segments were used to compute sediment bed loads in the river, describe the existing environment in those segments when possible, and provide basis for the impact analysis. The Final EIS then used historical dredging data (1998–2009) to determine where dredging occurred and at what intensity. These patterns were then compared with observed patterns of local bed degradation by using linear regression to analyze changes in local bed elevations in relation to dredging intensities and to total dredging amount as a percent of bed material load per segment.

Based on the above information, OD-R cannot utilize the sediment budget proposed by ED within the October 2015 Memo. The analysis within the memo introduces a new, un-vetted management framework that does not account for the dynamic set of circumstances that led OD-R to initially segment the River.

The sediment budget presented by ED suggests that approximately 2.4 million tons/year of sediment dredged from the system would be the greatest amount of sediment that could be dredged without leading to degradation. This analysis represents a worst case scenario that permits 'zero degradation'. OD-R evaluated a similar Alternative [A] (Table 4-1) in the Final EIS which would have cumulatively allowed approximately 2.2 million tons of material per year to be dredged from the Missouri River between 2011 and 2015. This level of dredging was determined to be impracticable from a public interest standpoint in four Segments (St. Joseph, Waverly, Jefferson City, and St. Charles). The 2011 Final EIS and ROD determined that authorizing dredging amounts higher than Alernative (A) in the aforementioned Segments was the environmentally

preferred alternative, so long as it did not result in more than slight degradation in the short and long-term. Our determination was not based on a 'zero bed degradation' standard, rather, it was based on a public interest review that took into consideration all substantial public interest factors. Because ED's approach would not be consistent with the decision making framework within the Final EIS and ROD, and because a similar total material alternative was already found to be impracticable in four Segments, OD-R will not be carrying this engineering consideration forward in this document.

The model utilized in the Final EIS and ROD to predict short and long-term changes in bed elevations has been validated in the last five year. There is no apparent need to modify the Regulatory decisional framework at this time. Further, the Regulatory Branch's Adaptive Management Framework appears to be adequately detecting recent changes in bed elevation and segment trends compared to baseline data. Acting in concert, the Regulatory decisional framework and Adaptive Management Framework have undergone rigorous analysis, robust public interest review, and have experienced real-world use; the continued utilization of these components is an appropriate means, and appears to be the best method currently available to address the regulatory responsibilities assigned to the Corps under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

- The cumulative extraction totals requested by Holliday Sand and Gravel Company and Capital Sand Company, Inc. exceeded the highest alternative evaluated under the 2011 Final EIS and ROD. Thus, to properly evaluate these proposed actions the Corps will evaluate a higher tonnage alternative in the Waverly Segment.

- In response to requests made by the U.S. Fish and Wildlife Service, we updated our BA for Missouri River commercial dredging activities that was previously prepared in conjunction with the Final EIS. To aid in this effort, we requested the dredgers prepare a biological report that incorporated the most recent and best available scientific information associated with pallid sturgeon larvae behavior, young-of-year occurrences, habitat selection, habits, and ecology. Most importantly, an analysis of the direct and indirect effects caused by dredging on the aforementioned life history characteristics was performed and presented in a format easily incorporated into our 2011 BA.

(6) Issues/comments forwarded to the applicant by the Corps in a letter dated 8 May 2015 (Appendix 8):

- The USEPA indicated that the requested extraction totals in the Waverly, Jefferson City, and St. Charles river segments exceed the original authorized extraction totals permitted in 2011. The USEPA also emphasized the requested extraction totals in the Waverly Segment exceeded the highest evaluated

alternative in the 2011 Final EIS for Missouri River Commercial Dredging and the ROD. Thus, the USEPA does not believe there is justification for the requested tonnage increases above those authorized in the 2011 ROD.

- The USEPA believes the 404(b)(1) Guidelines have not been met and there are other less environmentally damaging practicable alternatives available because sand and gravel mining are not water dependent.

- The USEPA also has concerns that commercial dredging on the Missouri River is causing significant degradation of our Nation's waters by adversely affecting human health and welfare, aquatic life and other wildlife, aquatic ecosystem diversity, productivity and stability, and/or recreation, aesthetic and economic values.

- The U.S. Fish and Wildlife Service (Service) believes significant new information regarding population status, larval ecology, and habitat conditions of the endangered pallid sturgeon have surfaced since the issuance of the 2011 dredging permits. Considering new and historic information, the effects of dredging should be analyzed for all life stages and habitats of the pallid sturgeon; therefore the Corps should update and/or revise the 2011 BA.

- The Missouri Department of Transportation requests that dredging not be allowed with 1,000 feet of any bridge pier or abutment to eliminate the potential for scouring and protect the structural integrity of state's infrastructure.

- WaterOne believes that the Missouri River commercial dredging permits should not be renewed until the conclusion of the Missouri River Bed Degradation Feasibility Study. The company believes that dredging is a significant contributor to river degradation and hence, a threat to public and private infrastructure.

(7) Applicant replied/provided views.

Lathrop and Gage, David Shorr provided the following comments in letter a dated 31 August 2015 (Appendix 9):

- The Dredgers support USACE's analysis of dredging volumes and location, review of bathymetric data, and comparisons to baseline data. This is consistent with the adaptive management framework in the ROD. Preliminary data indicates that the effect of commercial sand dredging is nominal with regard to the bed and that adjustments can be made where stress may be present.
- The applicants are aware that requested extraction totals exceed the highest evaluated alternative in the Final EIS. However, the requests are not outside the adaptive management framework.
- USEPA recognition that extraction request exceed the highest alternative analyzed in the 2011 Final EIS and ROD is accurate. However, the USEPA's

claim that there is no justification for the requested tonnages is not accurate. Bed and Water Surface Profile data from 2011-2014 show that the Waverly Segment continues to accumulate additional material (sand). The Dredgers may request additional tonnage in aggrading segments under the AMF.

- The USEPA does not provide any information or data to substantiate its claims that dredging is causing degradation of the Nation's waters.
- The Dredgers are aware of the scientific updates surrounding the pallid sturgeon since 2011 and agree with the USFWS that an update to the Corps 2011 BA should occur. The Dredgers agree to formulate a Biological Report to provide to the Corps to incorporate into an updated BA.
- The Dredgers do not believe a 1,000 foot buffer is a protection standard to safeguard MODOT's infrastructure.
- The Dredgers do not believe their projects are causing significant impacts to the Missouri River. They believe significant impacts to the bed in the Kansas City Segment are being caused by the Bank Stabilization and Navigation Project.

Holliday Sand and Gravel provided the following comments in letter a dated 18 September 2015 (Appendix 10):

- River scour near bridge piers is a common occurrence. However, there is no evidence to suggest that dredging within 500 feet of the structure exacerbates the scouring.
- Increasing the restriction zone around bridge piers could cause the applicant more than $40,000 a year.
- Holliday challenged whether additional public involvement was necessary because of the heavy public involvement resulting from the EIS that resulted in significant reductions in tonnage in some segments, bathymetric surveys, and monthly monitoring reports.
- Holliday believes suspending the dredging permits until after the completion of the Missouri River Bed Degradation Feasibility Study is not necessary and would be very costly; in fact, the Feasibility Study's economic model explains the worst possible case scenario would be to eliminate dredging on the River all together.
- Bathymetric data collected to date seem to indicate the mitigation measures included as special conditions in the 2011 permits have been successful at stalling degradation and allowing aggradation, in spite of the 2011 flood.
- Holliday does not agree with the preliminary outputs of the Feasbility Study/Mobile Bed Model and contests that their input has improved the Mobile Bed Model.
- Some off-river mining sites have been developed since dredging tonnage restrictions were implemented on the Missouri River. However, the off-river mining has still failed to become a reliable supplier of concrete sand.
- To prevent significant negative economic impacts to the Region's construction industry Holliday has requested that its tonnage allocation in the Waverly Segment be modestly increased each year for five years.

- The Waverly Segment has been aggrading, has very little structural risk, and the phased incremental tonnage allocation will not contribute to degradation. They have calculated a net deposition of 1.1 million tons of sand in the upper Waverly Segment, MRM 345-357 from 2009-2013. Considering the 2011 high water event, this continuing trend of aggradation clearly shows a stable and aggrading reach under the worst conditions.
- The requested tonnages in the Waverly Segment are also consistent with the AMF identified in the Final EIS and ROD.
- The EIS based dredging intensity on the percentage of tons dredged versus the bed material load in tons. The requested increases in the Waverly segment by Holliday represent only 22% of the average annual tons of bed material load (4,956,000 tons) calculated in the EIS between 2000-2009. Comparatively, the ROD approved dredging at 37% and 45% bed load in the Jefferson City and St. Charles Segments, respectively.
- USEPA's claim that the increased tonnages in the Waverly Segment would lead to significant degradation of the Nation's Waters is not consistent with the analysis and interpretations found in the EIS.
- Holliday believes that the Final EIS did establish a sediment budget for the Missouri River since extraction totals were based on removing sustainable bed loads. Holliday removes 1/10 of the bed load material in the Kansas City Segment according to calculated USGS bed loads between 1995-2006.
- USEPA's claims that there is no need for the increased extraction levels and the proposed actions don't meet the 404(b)(1) guidelines are unsubstantiated. The ROD identified the environmentally preferred alternative as the LEDPA. The USACE provided a comprehensive alternatives analysis in order to identify the LEDPA.
- It is a common misconception that dredging results in a headcut on the Missouri River. The EIS addressed this in Section 4.2 stating "Short-term impacts in all sections under the Proposed Action would include a local decrease in sediment availability as the dredge area captures sediment transported by the river, and erosion occurs downriver as the river replaces the captured sediment."
- USEPA's claims are false that the proposed action could cause or contribute to violations of state water quality standards, contribute to the violation of toxic effluent standards under Section 307 of the Clean Water Act, or further degrade water quality. As part of the EIS, extensive water quality tests were performed upstream and downstream of an operating dredge and near drinking water intakes. The test showed no measurable difference in water quality upstream from downstream of the operating dredge. The expert agencies in water quality and biological matters are the Missouri Department of Environmental Quality (MDEQ) and the US Fish and Wildlife Service. These agencies have previously authorized commercial dredging under their respective regulatory authorities.
- Holliday practices responsible dredging and does not degrade water quality. Previous authorizations from the USACE, USFWS, and MDEQ affirm that dredging is not significantly degrading the Nation's waterways.

- Holliday's dredges contain the appropriate USCG signage and lights, are buoyed, and are never moored in the channel. The company remains committed to ensuring the health and safety of citizens navigating the Missouri River.
- Holliday disagrees with the USEPA's claim that avoidance, minimization, and compensation has not been applied to the previously proposed action. Holliday has reduced extraction tonnages in the Kansas City Segment by 79%, limited dredging in 5-mile reaches, submits dredging reports, adheres to necessary setbacks around infrastructure and utilities, and will decrease extraction in areas that experience degradation. Each of these measures has costs to the dredgers. These mitigation measures have proved effective at stabilizing or aggraded localized reaches in the River.
- Holliday is committed to assuring the Missouri River commercial sand dredging, necessary for building and maintaining the entire infrastructure of the Kansas City Region, is accomplished in a sustainable manner with minimal to no environmental impact in accordance with the natural delivery of bed material sediment that the Missouri River provides.

(8) The following comments are not discussed further in this document as they are outside the Corps purview. *Explain.* N/A

4. Alternatives Analysis:

a. Basic and Overall Project Purpose (as stated by applicant and independent definition by Corps).

☒ Same as Project Purpose in Section 1.
☐ Revised: *Insert revised project purpose here and explain why it was revised.*

b. Water Dependency Determination:

☒ Same as in Section 1.
☐ Revised: *Insert revised water dependency determination here if it has changed due to changing project purpose or new information.*

c. Applicant preferred alternative site and site configuration.

☒ Same as Project Description in Section 1.
☐ Revised: *Explain any difference from Section 1.*

d. Criteria.

Issue	Measurement and/or constraint
Geology and Geomorphology	More than slight bed degradation
Infrastructure	Adverse effects stemming from more than slight bed degradation
Federally Listed Species	Adverse effects stemming from more than slight bed degradation or operational measures
Cultural Resources	Adverse effects stemming from more than slight bed degradation or direct impact

Economics and Demographics	Adverse effects stemming from more than slight bed degradation
Economics and Demographics	Effects of reduced or increased dredging tonnages

e. Alternatives Considered in the EIS:

In 2011, the Corps of Engineers completed a Final EIS and issued a ROD for commercial dredging activities on the Missouri River; these documents disclosed environmental impacts associated with the 2011 permit decision and ongoing re-issuance of dredging permits.

The analysis of impacts to environmental resources within the Final EIS showed that for most resource areas, impacts either varied little with commercial dredging amounts or varied in direct relationship to geomorphologic impacts (primarily changes in surface water levels and river bed degradation). In contrast, economic impacts were primarily driven by increased use of alternate sources of sand and gravel to offset reduced dredging in the LOMR. While approval of the Proposed Action may have suited the interest of the commercial dredgers, the impacts analysis found that it would likely result in continued and in some cases substantial bed degradation, especially in areas previously dredged. At the same time denial of all permit applications, the No Action Alternative, would likely result in negative socioeconomic impacts to communities along the river, impacts to industries dependent on commercially dredged sand and gravel, and impacts associated with development of new sand and gravel resources to replace river dredging.

In addition to the Proposed Action and No Action Alternative, Alternatives A, B, and C with dredging amounts for each segment that were lower than the Proposed Action were evaluated.

Table 4-1. Dredging Amounts for the Proposed Action and Alternatives by River Segment (tons/year)

Segment	Annual Average (2004–2008)	Proposed Action	No Action Alternative	Alternative A	Alternative B	Alternative C
St. Joseph (RM 391 – RM 498)	326,928	1,150,000	0	350,000	860,000	330,000
Kansas City (RM 357 – RM 391)	2,520,107	4,060,000	0	540,000	1,230,000	2,520,000
Waverly (RM 250 – RM 357)	815,505	1,005,600	0	500,000	1,140,000	820,000
Jefferson City (RM 130 – RM 250)	1,633,852	2,750,000	0	430,000	980,000	1,630,000
St. Charles (RM 0 – RM 130)	1,706,895	4,384,400	0	370,000	840,000	1,710,000
Total dredging[a]	**7,003,287**	**13,350,000**	**0**	**2,190,000**	**5,050,000**	**7,010,000**

Alternate Sources		***N/A***	***7,003,287***	***4,813,287***	***1,953,287***	***0***

Note: N/A = Not applicable.
[a] Sum of Dredgers request by segment – the total amount authorized would be limited to approximately 11.6 million tons per year.

Proposed Action
Eight companies requested approval of 11 Department of the Army (DA) Permits (DA permits) for dredging a total of 13,350,000 tons of sand and gravel per year from designated reaches of the LOMR, generally with the existing permit conditions (e.g., exclusion zones and operating protocols).

Alternative A
Allowable commercial dredging tonnages would be set at levels that represent 10% of the estimated bed material load at below-average flow conditions. Each segment would be limited to the annual amount shown in the column for Alternative A in Table 4-1 with the result that total dredging in all segments combined would be 2,190,000 tons per year. It was assumed that dredging locations would be limited to those river reaches shown for each applicant in Table 1-1 of the ROD subject to the existing permit conditions (e.g., exclusion zones and operating protocols).

Alternative B
Allowable commercial dredging tonnages would be set at levels that represent 15% of the estimated bed material load at average flow conditions. Each segment would be limited to the annual amount shown in the column for Alternative B in Table 4-1 with the result that total dredging in all segments combined would be 5,050,000 tons per year. It was assumed that dredging locations would be limited to those river reaches shown for each applicant in Table 1-1 of the ROD subject to the existing permit conditions (e.g., exclusion zones and operating protocols).

Alternative C
Allowable commercial dredging tonnages would be set at levels that approximate recent dredging amounts for a five year average in each segment. Each segment would be limited to the annual amount shown in the column for Alternative C in Table 4-1 with the result that total dredging in all segments combined would be 7,010,000 tons per year. It was assumed that dredging locations would be limited to those river reaches shown for each applicant in Table 1-1 of the ROD subject to the existing permit conditions (e.g., exclusion zones and operating protocols).

Environmentally Preferred Alternative
The Environmentally Preferred Alternative was identified from among these alternatives by selecting the alternative for each segment that allowed the largest amount of dredging in each segment while keeping the risk of future bed degradation to a minor or slight level. The Environmentally Preferred Alternative was a composite alternative that included:

- St. Joseph Segment – Alternative B
- Kansas City Segment – Alternative A

- Waverly Segment – Alternative B
- Jefferson City Segment – Alternative C
- St. Charles Segment – Alternative C
- Total Combined Dredging Amount - 5,880,000 tons per year

f. New Alternatives Considered

Proposed Action

The proposed action for the 2016 permits is described in Table 1-1. Requested totals were generally in line with 2011 permitted totals. Increased tonnages were requested within the Waverly, Jefferson City, and St. Charles Segments by three companies.

Alternative D

This is a new alternative since the finalization of the 2011 EIS and ROD and was thoroughly evaluated in Appendix 7 (Environmental Assessment). This is a new alternative since the finalization of the 2011 EIS and ROD. Allowable commercial dredging tonnages would be set at levels near the upper end of the range of alternatives that have verifiably maintained a stable bed elevation as indicated by monitoring data in the Jefferson City Segment. Allowable commercial dredging tonnages would be set at levels that represent 38% of the estimated bed material load at below-average flow conditions, i.e. 1,900,000 tons per year in the Waverly Segment. It was assumed that dredging locations would be limited to those river reaches shown for each applicant in Table 1-1 of the ROD subject to the existing permit conditions (e.g., exclusion zones and operating protocols) and subject to rigorous monitoring under the Adaptive Management Framework.

g. Other alternatives not requiring a permit, including No Action.

Alternate Sources of Material

Currently available alternate local sources of commercial sand and gravel, or commercial sand and gravel imported from outside the local market would supply sand and gravel needs in the market and region currently served by existing commercial dredging permits. Denial of permit requests could result in the disruption of business operations dependent on sand and gravel operations in the LOMR or within certain market areas along the LOMR where there are no locally available alternate sources of aggregate. After stockpiles of sand and gravel were exhausted, the applicants would be unable to satisfy (using sand and gravel from the LOMR) the needs and contracts of customers who have routinely purchased sand and gravel materials from the applicants. This may allow certain applicants with concrete or asphalt production capabilities to produce products from their own supply of sand and gravel, possibly at lower levels of production or higher costs. See Section 2.3.2.1 of the Final EIS and Section 2.5 of the ROD for more detailed information about alternate sources of sand and gravel.

No Action

The No Action Alternative also would result in short term and long term, and direct and indirect effects associated with obtaining sand and gravel from land-based operations within the region, importing sand and gravel from other locations, and recycling materials. Implicit in this alternative are the practicality of relying on sources other than commercial

dredging in the LOMR and the assumption that other sources can satisfy the demand for sand and gravel. See Section 2.3.2.1 of the Final EIS and Section 2.5 of the ROD for more detailed information regarding the No action Alternative.

h. Analysis of practicability and reasonableness of remaining alternatives. *Describe/explain.*

To properly establish alternatives in the Final EIS, the USACE compared Missouri River bed material load estimates for each segment to the average annual amount of material dredged during the 2000–2009 time period for average and below-average flows.

Alternatives (A), (B), and (C)
Using the above information as guidance, dredging levels for Alternatives (A) and (B) were developed. Alternative (A) allowed 10 percent of the estimated bed material load under below-average flow conditions (represented by the period from 2000–2009, to be extracted. Alternative (B) allowed for a somewhat higher level, 15 percent of the estimated bed material load under average flow conditions (represented by the period from 1994–2009). Alternative (C) dredging limits were based on average annual dredging levels by river segment from 2004 to 2008. Together with the Proposed Action and the No Action Alternative, these three alternatives bound the range of practicable alternatives at the time the EIS was finalized and, with the exception of the Waverly Segment and the proposed action, bounds the range of alternatives for the 2016 permit decision.

A thorough evaluation providing rationale for the establishment of differing dredging amounts, annual average and Alternatives (A – C), is located in Section 2.6 of the ROD and Section 1.7 of the EA.

Alternative (D)
A new Alternative (D) was developed to evaluate the Dredgers requests for additional tonnage in the Waverly Segment as part of the 2016 permit renewals. This Alternative, similar to Alternatives (A – C), was developed by examining the bed material loads calculated in the Final EIS for the Segment, but capped the available tonnage at levels that have proven to maintain stable bed conditions in nearby segments, as identified by bathymetric data.

A thorough evaluation providing rationale for the establishment of Alternative (D) is located in Section 1.7 of the EA (Appendix 7).

i. Least environmentally damaging practicable alternative. *Describe/explain.*

The Final EIS (Section 2.7) and ROD (Section 2.5.6) divided the LOMR into five segments for analysis and then identified the Environmentally Preferred Alternative/LEDPA which was a composite of the best alternative for each segment. The LOMR is not homogenous throughout its length. The bed load, and therefore the dredging capacity, varies with the geomorphology of the river, the geology of the floodplain, and sediment and water input from tributaries. To be able to evaluate and regulate the

potential effects of dredging on river geomorphology, the spatial variation in bed load needed to be taken into account. Dividing the LOMR into segments based on the major sediment input from tributaries was the method that was determined to appropriately do this and is still practicable for the dredgers.

Segment Limits – Kansas City, Jefferson City, St. Charles

Segment limits will remain identical to the 2011 levels in the Kansas City (Alternative A), Jefferson City (Alternative C), and St. Charles (Alternative C) Segments (Table 4-2). Justification for the initial establishment of these levels and a determination as to why these alternatives represent the LEDPA are found in the ROD (Section 4.2.3).
The USACE has determined that the dredging amounts in the above segments are practicable and therefore the LEDPA when considering monitoring data collected from 2011-2014 evaluation of the bathymetric and water surface data by the USACE (Appendix 11). These segments experienced bed change in the line with the natural variance commonly witnessed in the Missouri River, but no segment has demonstrated an aggradation trend when considering recent and historic data. Specifically, the Jefferson City segment slightly aggraded and the St. Charles segment was stable during the 2011 permitting cycles (Appendix 11).

Segment Limits – St. Joseph Segment

A moderate decrease in authorized tonnages will be administered in the St. Joseph Segment for the 2016 permits. Extraction totals in this Segment will be reduced from 860,000 tons to 330,000 tons annually due to the degradation trends identified in Final EIS and Appendix 11 of this CDD. The reduced tonnage was selected from the range of alternatives analyzed in the USACE's Final EIS, Section 3.4.6.3. The authorized extraction totals for this Segment will align with Alternative (C) in the Final EIS and represent a 62% decrease in authorized tonnage limits from 2011; just as the 2011 selected Alternative (B) was not anticipated to lead to more than slight degradation in the short and long term, the newly selected Alternative (C), should not cause degradation trends in the St. Joseph Segment. Appendix 11 explains how degradation in the St. Joseph Segment is not spatially associated with ongoing dredging. The USACE will not authorize dredging in the most degraded reaches of the St. Joseph Segment. This includes River Miles 390 to 413 and 426 to 434.

A reduction in extraction totals and excluding degraded reaches from the segment will prevent the exacerbation of degradation trends as they migrate upstream. Water Surface Profiles will be evaluated yearly and Hydro-acoustic Bed Surveys will be conducted in 2019 to help identify ongoing River trends and adjust permitted dredging levels if necessary.

It should be noted, that Alternative (A) would be a viable alternative in which the tonnage (350,000 tons) would be reduced from previous authorizations and represents a worst case scenario from a bed load perspective (Alternative (A) would allow 10 percent of the estimated bed material load under below-average flow conditions). However, given the level of degradation observed in the Segment and the fact that the average yearly total

extraction for this reach is 174,283 tons from 2011 through 2014, authorized extraction levels under Alternative (C) offer the greatest reduction in dredging while still allowing the Segment to be a viable reach for the Dredgers.

Segment Limits - Waverly Segment

Increases in the Waverly Segment are outside the range of alternatives considered in Section 3.4.6.3 and Appendix A of the Final EIS. The selected alternative (B) in the 2011 ROD was the highest alternative (1,140,000 tons) evaluated. According to sources within the Final EIS (Section 3.4.6.2), the Waverly segment has experienced an aggradation trend since 1998 even with a substantial high flow event in 2011 that significantly flushed the system of sediment. Acknowledging these two facts, the USACE believes the authorization of an additional 738,000 tons of material will not lead to more than slight degradation in the short and long-term in the Waverly Segment. The details surrounding the decision to authorize a new Alternative (D) can be found within the EA (Appendix 7) attached to this CDD.

Table 4-2. The USACE 2016 Proposed Action Extraction Totals

Application Number	Applicant Name	River Reach Requested	Annual Tons Of Material Authorized By 2011 DA Permits	USACE Proposed Action Tonnages
NWK 2011-00361	Capital Sand Company, Inc. (Capital Sand)	St. Charles Segment	140,000	**140,000**
		Jefferson City Segment	1,350,000	**1,350,000**
		Waverly Segment	370,000	**2016 – 370,000**
				2017 – 452,500
				2018 – 535,000
				2019 – 617,500
				2020 – 700,000
NWK 2011-00362	Hermann Sand and Gravel, Inc. (Hermann) Sand)	St. Charles Segment	120,000	**120,000**
		Jefferson City Segment	120,000	**120,000**
NWK 2011-00363	Holliday Sand and Gravel Company (Holliday Sand)	Waverly Segment	770,000	**2016 – 770, 000**
				2017 – 847,000
				2018 – 924,000
				2019 – 1,001,000
				2020 – 1,078,000

Application Number	Applicant Name	River Reach Requested	Annual Tons Of Material Authorized By 2011 DA Permits	USACE Proposed Action Tonnages
		Kansas City Segment	2011 – 1,200,000	**540, 000**
			2012 – 900,000	
			2013 – 850,000	
			2014 – 800,000 (*permit modification*)	
			2015 – 540,000	
		St. Joseph Segment	860,000	**330,000**
NWK 2011-00364	Con-Agg of MO, L.L.C. (Con-Agg)	Jefferson City Segment	160,000	**160,000**
MVS 2011-00177	Limited Leasing Company	St. Charles Segment	990,000	**990,000**
MVS 2011-00178	J.T.R. Inc. (Jotori Dredging)	St. Charles Segment	460,000	**460,000**
Total (All Dredgers Combined)	2016			**5,350,000**
	2017			**5,509,500**
	2018			**5,669,000**
	2019			**5,828,500**
	2020			**5,988,000**

Limits on Localized Dredging Intensity

The Final EIS (Section 2.7.4) determined that 60,000 tons per mile per year may be the upper limit of local dredging intensity that is reasonably unlikely to result in local bed degradation. The Environmentally Preferred Alternative identified for each segment in the Final EIS (Section 2.7.4) was conditioned on applying a target level of dredging intensity in conjunction with segment limits. It is recognized that this amount is not a precise measurement and evaluation of monitoring data during the upcoming permit cycle may indicate that modifications are warranted within the framework of the EIS and ROD. When the Dredgers learned of this condition of the Environmentally Preferred Alternative, they acknowledged it may be necessary in some areas including Kansas City and Jefferson City but they thought it was impracticable, burdensome, and unnecessary outside the most degraded reaches. The Dredgers suggested applying a five-mile dredging intensity limit to the most degraded "hot spots." The USACE agreed that applying the 60,000-tons per mile

per year dredging target to each individual river mile throughout the entire river presents practicality difficulties to both the Dredgers and the USACE. The USACE considered applying this limit on a one-mile basis, but in evaluation of the available river bed elevation models, there was too much variability and uncertainty at the one mile level. Choosing to use a longer reach, i.e., five miles, allowed for better identification and delineation of the "hot spots". Limiting the most heavily dredged and degraded five-mile reaches of the river to no more than 300,000 tons would allow better management by the USACE, would provide more flexibility to the Dredgers in reaches that are not degraded and at risk, and effectively protect those areas with the higher degradation trends (Final EIS Section 2.7.4). The USACE (Final EIS Section 2.7.4 and ROD Section 4.2.3.1.2) identified 17 specific five-mile reaches with water surface profiles more than two feet lower in 2005 than in 1990 and with a five-mile moving average bed elevation averaged over 2007, 2008, and 2009 that was more than a foot lower than in 1998. These degraded reaches occur between river miles 15 to 20, 25 to 35, 90 to 100, 140 to 150, 355 to 395, and 445 to 455. Additionally, river miles 350 to 355 will be added to this list for this permitting cycle. Increased dredging in the Waverly Segment has the potential to cause minor impacts to resources in this reach, including but not limited to bridges, water intakes, navigation, flood control, endangered species, and cultural resources, which would be contrary to the public interest if this additional 5 mile intensity restriction were not added.

The USACE has determined that based on the available information, limiting dredging to no more than 300,000 tons per year in each of these 18 five-mile reaches is a practicable and necessary part of the LEDPA and will comply with the Section 404(b)(1) Guidelines.

Monitoring and Adaptive Management Framework

The USACE has determined that monitoring is a practicable and necessary part of the LEDPA. The USACE evaluated existing models for identifying degradation from water surface profiles and hydroacoustic bed elevation surveys and concluded that the state of these models are not advanced sufficiently to accurately identify changes within one year. Accordingly, USACE concluded, based on available information, that the only practicable way to identify degradation trends and to make adaptive changes is to use multiple years of data. Water surface profiles are prepared annually by the USACE and a hydroacoustic bed elevation survey will be provided by the Dredgers in the fourth year of each permit cycle, even if the USACE provides one through another study or river program during previous years. The USACE will evaluate the data and meet with the Dredgers and state and federal agencies in the winter of each year to discuss the condition and trend of the river as shown by the most recent water surface profiles or surveys. Permits would be issued for five-year periods. During the five-year permit cycle, if the USACE determines from new data or analysis that additional measures should be taken to protect critical resources, it may modify, suspend, or revoke the permit at any time. Renewal of the dredging permits after five years would be a new Federal action requiring assessment of the prior NEPA documentation and assessment of any new information. In 2020, the data from the previous four years will be compared with the 2009 water surface profile and bed elevation baselines to evaluate if the permit limits and special conditions adequately

limited the impact of dredging to no more than slight degradation across the river as projected by the EIS. Trends of moderate to severe degradation instead of the slight degradation anticipated by the EIS for the Environmentally Preferred Alternatives for the St. Joseph, Waverly, Jefferson City, and St. Charles segments or any additional degradation in the Kansas City segment would require a thorough review of the permit provisions and could result in reductions in authorized dredging reaches or quantities, or implementation of other mitigation measures in the new permit decision. Likewise, aggradation trends could allow for consideration of increased quantities.

5. Evaluation of the 404(b)(1) Guidelines. (☐ NA - Section 10 only)
   a. Factual determinations.

Physical Substrate. ☐ See Existing Conditions, section 1. ☒ Localized changes in sediment loads and river bed composition occur in the vicinity of the dredging operation and are proportional to the amount of dredging occurring. The proposed dredging would result in the following effects in all segments: Short-term impacts in all segments would include a local decrease in sediment availability as the dredged area captures sediment transported by the river, and erosion occurs downriver as the river replaces the captured sediment. The amount of fine sediment in the water column would increase below the active dredge location as the dredging operation discharges unusable material back into the river. Long-term impacts in all segments would include an increase in the concentration of coarse gravel and cobbles on or near the surface of the river bed as material is dredged from the river bed and the material that is too coarse to retain is deposited back onto the surface of the river bed. See Section 5.1.1 of the ROD for a detailed account of anticipated effects to the substrate of the Missouri River.
Water circulation, fluctuation, and salinity. ☒ Addressed in the Water Quality Certification. ☒ Under the LEDPA, all segments of the LOMR are expected to experience no more than slight short and long term bed degradation, no more than a slight long term rise in high-flow surface water levels, and no more than a slight long term decline in low-flow surface water levels which would likely have a slight effect on alluvial aquifer levels near the LOMR and no effect on aquifer levels farther from the river channel. Under the LEDPA, neither dredging nor the discharge of dredged material will cause permanent changes in circulation patterns or shoaling

areas.

Under the LEDPA, neither dredging nor the discharge of dredged material will cause permanent changes in circulation patterns or shoaling areas. The stockpiling of material on shore will not affect groundwater recharge, wetland areas, or other areas of nutrient and mineral cycling, or natural areas of contaminant detoxification and fixation. River bed hydraulic conductivity would continue to be slightly altered for a short period in those locations subject to dredging. Change in the composition or depth of the substrate over existing horizontal municipal drinking water collector wells along the river could negatively affect the existing permeable aquifer material and reduce the quality and quantity of this municipal drinking water source.

See Section 5.1.1 of the ROD for a detailed account of anticipated effects to the water quality of the Missouri River.

Suspended particulate/turbidity.

☒ Turbidity controls in Water Quality Certification.

☒

Because natural suspended sediment variations in the LOMR have been documented as exceeding the average predicted suspended sediment levels at 100 and 400 feet from the dredge head, it is likely that dredging operations would not likely result in a significant change in suspended sediment concentrations, compared to natural variation. While dredging would result in elevated suspended sediment concentrations along the suspended sediment plume during periods of low background suspended sediment levels, the levels of suspended sediments from dredging would not likely exceed levels that occur naturally during high runoff events.

See Section 5.1.1 of the ROD for a detailed account of anticipated effects to the water quality of the Missouri River.

Contaminant availability.

☒ General Condition requires clean fill.

☒

Suspended solids or turbidity plumes data collected below a cutter-head dredge using underwater disposal near the confluence of the Kansas and Missouri rivers and in the Missouri River below Waverly, Missouri, indicated that concentrations return to background concentrations within a quarter mile or 1,300 feet. The same was true at other monitoring sites while collecting data below a baffled prop wash mechanized landing craft.

Unwanted dredged material will be discharged adjacent to the dredged site. The dredge and discharge sites are subject to the same sources of contaminants, and

materials and the two sites are substantially similar. Dredging has occurred in the same general reaches of the Missouri River for decades. The river bed is constantly changing and mixing sediments, filling in recently dredged areas with sediment washed in from above.

See Section 5.5 of the ROD for a detailed discussion regarding contaminants in the Missouri River and their relationship with commercial dredging.

Aquatic ecosystem and organism.

☒ Wetland/wildlife evaluations, sections 5, 6, 7 & 8.

☒

When combined with the past and present effects, along with those anticipated as a result of future non-federal actions within the Action Area, the LEDPA may affect, but is not likely to adversely affect pallid sturgeon.

Commercial dredging on the LOMR under the LEDPA is also not likely to adversely affect interior least tern or piping plover due to the lack of suitable nesting habitat within the Action Area, the rare occurrence and lack of breeding within the Action Area, and the absence of critical habitat in the Action Area.

The LEDPA would have no effect on Northern long-eared or Indiana bats and decurrent false aster. Terrestrial habitats for both species would not be affected by commercial dredging under the LEDPA and would not authorize the construction of any new sand plants.

The magnitude and duration of direct impacts on aquatic habitat at the dredge site would be determined by the time required for recovery and repopulation of the benthic areas. Typically, the more naturally variable an aquatic habitat, the less the direct effect of dredging on that habitat. Aquatic organisms common to these naturally variable areas are adapted to unstable sediment conditions and can better withstand the stresses imposed by dredging. Thus, due to the high level of variability in the benthic habitats in the LOMR, aquatic species present in these habitats are likely to be better able to withstand and recover from the localized alteration of benthic habitat due to dredging. Many areas of coarse aggregate sediments (e.g., cobble and bedrock) that substrate-spawning species (e.g., sturgeon and sauger) are known to use are found on outside bends that are constantly flushed free of fine sediment. Dredging under the LEDPA will be excluded from shallow-water habitat, in side channel areas, at many tributary junctions, and near dikes and revetments. These exclusion zones will cover most of the potential aggregate spawning habitat in the action area.

Benthic organisms (fish and macro-invertebrates) living near the river bottom or in the substrate in the main channel areas could be subject to entrainment from navigation. The extent of mortality would be a function of the amount of tow traffic on a given river system, towboat speed, and traffic volumes during the

period when larvae are most susceptible to shear stress. Studies show that entrainment from dredging would not likely be a substantial problem for many fish or shellfish species in water bodies experiencing periodic dredging.

It is expected that noise from the operation of dredges may result in avoidance of the dredging area by fish species sensitive to noise over the duration of the activity.

See Section 5.2 of the ROD for a detailed discussion regarding the LEDPA's affect to the biological communities that utilize the Missouri River.

Proposed disposal site.

☒ Public interest, section 6.

☒

Unwanted dredged material will be discharged adjacent to the dredged site. The dredge and discharge sites are subject to the same sources of contaminants, and materials and the two sites are substantially similar. Dredging has occurred in the same general reaches of the Missouri River for decades. The river bed is constantly changing and mixing sediments, filling in recently dredged areas with sediment washed in from above.

See Section 5.5 of the ROD for a detailed account of anticipated effects to the Missouri River at the discharge site.

Cumulative effects on the aquatic ecosystem.

☒ See section 7.d.

☒

"Cumulative impacts" are defined as the impact on the environment that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes the actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR Section 1508 C.F.R Part 1508.7). The cumulative impact analysis section is intended to provide a broader, more expansive assessment of potential impacts associated with implementing the Proposed Action and alternatives considering the wide array of other activities, new and ongoing projects, and programs in the Project area and vicinity. In this way, the potential interactions between commercial dredging of sand and gravel and reasonably foreseeable projects and programs can be explored, and any significant adverse or beneficial cumulative impacts can be identified and considered.

The Environmentally Preferred Alternative has been selected as the LEDPA with some modifications. The resource areas most affected by dredging were discussed In Section of the ROD. Impacts on infrastructure, federally listed

species, and cultural resources either did not vary substantially or they varied in direct relationship to geomorphic impacts (primarily changes in surface water levels and river bed degradation). Economic impacts were primarily driven by volume of authorized material and increased use of alternate sand and gravel resources to offset reduced dredging. Cumulative and secondary impacts are more fully discussed in Chapter 5 of the Final EIS, Section 4.2 of the ROD and Section 3.2 of the EA.
Secondary effects on the aquatic ecosystem. ☐ See section 7.d. ☒ See Above (Cumulative effects on the aquatic ecosystem)

b. Restrictions on discharges (230.10).

(1) It **has** been demonstrated in paragraph 4 that there are no practicable nor less damaging alternatives which could satisfy the project's basic purpose. The activity **is not** located in a special aquatic site (wetlands, sanctuaries, and refuges, mudflats, vegetated shallows, coral reefs, riffle & pool complexes). The activity **does not** need to be located in a special aquatic site to fulfill its basic purpose.

(2) The proposed activity **does not** violate applicable State water quality standards or Section 307 prohibitions or effluent standards. The proposed activity **/does not** jeopardize the continued existence of federally listed threatened or endangered species or affects their critical habitat. The proposed activity does not violate the requirements of a federally designate marine sanctuary.

(3) The activity **will not** cause or contribute to significant degradation of waters of the United States, including adverse effects on human health; life stages of aquatic organisms' ecosystem diversity, productivity and stability; and recreation, esthetic, and economic values.

(4) Appropriate and practicable steps **have** been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (see Paragraph 8 for description of mitigative actions).

6. Public Interest Review: All public interest factors have been reviewed as summarized here. Both cumulative and secondary impacts on the public interest were considered.

An intensive Public Interest Review was conducted as part of the Final EIS (Section 4), ROD (Section 5), and EA (Section 4). These documents address the impacts of the LEDPA on all public interest factors associated with the Kansas City, Jefferson City, St. Charles, and Waverly Segments, and partially the St. Joseph Segment. Reductions of overall tonnage and the inclusion of an expanded no dredging zone in the St. Joseph Segment presented the need for an alternative review of the LEDPA effects on the public interest factors in this Segment. This review found that, for most resource areas, impacts either did not vary substantially or they varied in direct

relationship to geomorphic impacts (primarily changes in surface water levels and river bed degradation). This result is reasonable given that impacts to most resource areas are indirect impacts that arise from the direct effects of dredging on geomorphology. Resource areas with impacts that varied in direct relationship to geomorphic impacts include infrastructure, federally listed species, and cultural resources. One resource area where the results did not vary in direct relationship to geomorphic impacts was economics. Economic impacts were primarily driven by volume of authorized material and increased use of alternate sand and gravel resources to offset reduced dredging.

The Corps decision to reduce dredging extraction totals and cease dredging from River Miles 390 to 413 and 426 to 434 was necessary when considering all the uses of the Missouri River, in particular the St. Joseph segment. The USACE, within the Final EIS, concluded that more than slight degradation, particularly in the most degraded reaches is contrary to the public interest; degradation could cause potentially significant impacts on resources, including but not limited to water intakes, navigation, flood control, endangered species, and cultural resources. More than slight degradation was observed in the above reaches (Section 4.2.3.1). If extraction was not curtailed in some fashion, dredging has the capability of exacerbating the degradation trends and adversely impacting critical features located in this segment of the River, primarily infrastructure and federally listed species.

On the surface it may appear that the economics of the St. Joseph area may be hampered by the curtailment of dredging, however, the permitted tonnage under the LEDPA represents almost double the actual average tonnage removed from this segment yearly from 2011 to 2014. Thus, the St. Joseph segment is likely to remain a viable source of sand for Holliday and should accommodate the area's sand needs. It should also be noted that the lower reaches of the St. Joseph segment actually supply the Kansas City metropolitan area. There should be no deficit in this area because the USACE is authorizing increases in the Waverly segment by nearly 700,000 tons; extraction of this additional tonnage in the upper reaches in the Waverly segment should more than compensate for any reductions that occurred in the lower reaches of the St. Joseph segment.

7. Effects, policies and other laws.
   a. Endangered Species Act. ☐ NA,

The *2003 Amendment to the 2000 Biological Opinion on the Operation of the Missouri River Mainstem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project, and Operation of the Kansas River Reservoir System* indicated that the portion of the LOMR between the Platte River, Nebraska and the LOMR confluence with the Mississippi River is lacking sediment transport and sediment availability, which is adversely affecting pallid sturgeon habitat development and maintenance. Further, the USFWS has stated that larval and juvenile pallid sturgeon are limited by the quantity of SWH that provides rearing and refugia habitat. River bed degradation, in conjunction with the local (reach-scale) removal of sand and gravel, could affect the quantity and distribution of natural or created shallow water habitat (SWH) in the LOMR. Potential effects on naturally occurring SWH could result from changes in

elevation, configuration, or connectivity of the SWH to the main river channel, or could affect the performance of SWH projects relative to design specifications. The Missouri River Commercial Dredging Final BA (updated October 2015) concluded that slight short and long term degradation is not likely to result in any substantial impacts on the abundance of SWH over and above natural year-to-year variations in the abundance of SWH. Changes on the order of moderate to substantial would likely be required for this to occur.

In response to the USACE's 13 March 2015 Public Notice the USFWS requested the USACE update their 2011 biological assessment because of recent information regarding the pallid sturgeon, particularly the larvae life stage of this species. The USACE updated our BA (Appendix 5) and concluded that when combined with the past and present effects, along with those anticipated as a result of future non-federal actions within the Action Area, the proposed action may affect, but is not likely to adversely affect pallid sturgeon. Based on the best available information reported in the literature and the specific factors on the LOMR, the potential for entrainment of adult pallid sturgeon due to dredging and towboat propellers and related mortality would be extremely low and improbable and thus judged to be minor and discountable. These conclusions are supported by studies where sturgeon entrainment was found to be low, as well as by other studies that found no entrainment of pallid sturgeon.

Without considering the context of the proposed action, drifting larvae appear be susceptible to dredging entrainment while in their free drift state. However, the water being processed while dredging is underway represents a tiny fraction of the water in the Missouri River system at any given point in time. Thus, the USACE is led to conclude the proposed action's potential to adversely affect the pallid sturgeon during the larval drift period is improbably low, thus minor and discountable.

Assuming post-drifting, age-0 pallid sturgeon utilize Missouri River habitat features in the same way as larval shovelnose sturgeon, entrainment of pallid sturgeon should not occur post-drift stage. Dredging will only be authorized within the Rectified Channel Lines of the Missouri River, outside of the habitats post-drift stage larval sturgeon have been found to be predominately utilizing. Although the thalweg was not extensively sampled as part of recent Corps age-0 sturgeon sampling efforts these data and our current understanding of sturgeon life history indicate habitat features that routinely hold post-drift stage, age-0 sturgeon do not overlap with permitted dredging zones.

The other potential adverse effect of increased dredging in the Waverly Segment on pallid sturgeon is through indirect effects on natural or created SWH, which is thought to be an important habitat to larval and juvenile pallid sturgeon. However, the effects on SWH are estimated to be minor and insignificant; these claims are supported by the USACE's analysis of the bathymetric data presented in Section 6 of the 2015 BA. Under the proposed action, dredging levels for the entire LOMR, each segment, and the most degraded reaches would be kept to levels expected to result in no more than slight bed degradation and associated changes in low-flow and high-flow water surface elevations

in the short term (5 years) and long term. Changes of this magnitude are not expected to result in any substantial impacts on the abundance of SWH over and above natural year-to-year variations in the abundance of SWH. Many of the SWH projects in the LOMR also have protection from the localized effects of commercial sand and gravel dredging because they are within, partially within, or adjacent to dredging exclusion areas. Additionally, annual water surface profiles and a bed elevation survey in the fourth year of each five-year permit cycle were and will be used to monitor and to ensure that bed degradation is not more than expected and that SWH is not lost.

Of the other potential effects of the proposed action, all were judged to be minor and discountable within Sections 6.1 and 7.1 of the BA (Appendix 5). These include:

- Based on the existing information, there appears to be no basis for concluding that noise from commercial sand and gravel dredging would adversely affect pallid sturgeon.

- There is little evidence of avoidance of dredging operations by pallid sturgeon (e.g., due to disturbance, noise, or turbidity), and there is little indication of effects of commercial dredging operations on spawning movements and migrations.

- Based on the current understanding of pallid sturgeon spawning habitats and resource protection zones, commercial dredging is very unlikely to result in direct disturbance of known and suspected pallid sturgeon spawning habitats.

- Increased elevated suspended sediment would have little effect on pallid sturgeon, a species adapted to high levels of turbidity; and plumes downstream of dredging activities may result in a slight temporary beneficial increase to no change in cover habitat to pallid sturgeon that are located downstream of dredging activities.

- The effects of dredging on pallid sturgeon foraging would likely be limited and temporary, given that the proportion of the total foraging area of the river bottom dredged would be low, and the probability that alteration of the bottom substrates may produce equally productive fish and invertebrate habitats and greater substrate diversity.

- The proposed action would not affect the flow regime of the LOMR, which is largely controlled by flow releases from upstream reservoirs.

- The effects on dredging on water quality would be minor, and although there may be an increase in some contaminants liberated from bottom sediment, these levels would be very low and rapidly diluted in the river.

The U.S. Fish and Wildlife Service ☒concurred/☐ provided a Biological Opinion(s) with the Corps effect determinations on 20 November 2015. (Appendix 12)

b. Essential Fish Habitat (EFH). Adverse impacts to Essential Fish Habitat will not result from the proposed project. *Explain.* There is no EFH established within the project area.

c. Historic Properties. Section 106 of the National Historic Preservation Act: The National Register of Historic Places and the Federal Register have been checked to determine if any properties listed or proposed for listing in the National Register would be impacted by the project. In addition, the Missouri and Kansas State Historic Preservation Officers have been contacted to determine if any properties eligible or potentially eligible for listing in the National Register would be impacted by the work.

In response to the Kansas City District's inquiry, the **Kansas State Historical Society/Missouri Department of Natural Resources Historic Preservation Program** provided the District with a written response dated 18 March 2015 and 25 March 2015, respectively (**Appendix 13**), which stated that the proposed project would have no effect on any property listed on the National Register of Historic Places nor any historic or archeological site listed in the state inventory.

Research and consultation conducted during the 2011 Final EIS identified 128 cultural resources in the Project Permit Area. These resources include 91 shipwrecks, 12 Lewis and Clark campsites, 10 archaeological sites, and 15 bridges. The Historic Trail also passes through the Project area. The majority of cultural resources (112, or 88 percent) have not been relocated or evaluated for inclusion in the NRHP. In terms of location, 113 sites were identified in the main channel of the LOMR, 13 were identified along the banks of tributaries, and two were identified at a proposed sand plant location. Project effects to the 128 NRHP-evaluated and unevaluated sites are discussed in Section 4.13 of the Final EIS.

Because of the extensive history of dredging in the main channel of the LOMR, direct adverse effects of dredging on shipwrecks, Lewis and Clark sites, and bridges are not anticipated provided that dredging activities continue to occur in their historical locations and dredging exclusion zones are maintained around known shipwrecks, structures built or authorized by the U.S. Government, normal bank lines, islands, and bridges. Expansion of dredging activities to new areas would require assessment of potential cultural resource impacts as required by existing USACE permit conditions. Discovery of unidentified sites located in the main channel are also addressed through USACE permit conditions.

The principal indirect effects of dredging on cultural resources stem from tributary headcutting and erosion and scouring of the river bed near bridge abutments. These processes may (1) destroy or damage all or part of the property; or (2) expose archaeological resources, thereby, making an entire site or part of a site vulnerable to human disturbance such as looting or vandalism. Because tributary degradation has not been well quantified on the LOMR and each tributary is different with regard to size, degree of modification, length between the main channel and control points, degradation, and other factors, impacts on the geomorphology of each tributary were not analyzed individually. Instead, the geomorphic impact assessment within the Final EIS characterizes the likelihood that tributary degradation would increase under an alternative based on the change in low-flow water surface elevations on the mainstem LOMR occurring near the tributary. In general, low-flow water surface elevations on the LOMR would need to decrease a moderate or substantial amount before

tributaries would likely be affected (see Section 4.2.3.4 of the Final EIS (USACE 2011)).

The USACE has addressed degradation concerns in the St. Joseph segments by reducing dredging tonnages and identifying no dredging zones; no further degradation is anticipated in this Segment as a result of dredging and thus, no adverse effects to historic properties are expected in this Segment.

The USACE permit conditions include the requirement to notify the USACE and state agencies if unidentified cultural resources are discovered; a description of existing dredging exclusion zones to avoid and/or reduce the potential for adverse effects to historic properties; and the requirement to notify the USACE and state agencies if the Dredgers propose to expand dredging into areas not previously dredged. Additionally, the USACE will not authorize dredging in those areas where historic properties have been identified.

The LEDPA is expected to result in no more than slight bed degradation in the LOMR. This would prevent or minimize the direct and indirect effects on cultural resources associated with tributary head cutting. USACE permit conditions will include the requirement to notify the USACE and state agencies if unidentified cultural resources are discovered; a description of existing dredging exclusion zones to avoid and/or reduce the potential for adverse effects to historic properties; and the requirement to notify the USACE and state agencies if the Dredgers propose to expand dredging into areas not previously dredged. No adverse effects to historic properties, therefore, are expected from authorization of the LEDPA. No Programmatic Agreement between the USACE and the National Park Service, State Historic Preservation Offices of Kansas, Missouri, and Nebraska, tribes, and ACHP would be necessary. The LEDPA complies with the provisions of Section 106 of the NHPA.

d. Cumulative & Secondary Impacts.

See Section 5 of this Document and Chapter 5 of the Final EIS, Section 4.2 of the ROD and Section 3.2 of the EA a discussion on the cumulative effects of the LEDPA. No significant cumulative, indirect or secondary impacts not already addressed in the above documents are expected to result from authorization of the LEDPA.

e. Corps Wetland Policy. Based on the public interest review herein, the beneficial effects of the project outweigh the detrimental impacts of the project.

f. Water Quality Certification under Section 401 of the Clean Water Act **has** been issued by **MDNR on 9 December 2015 and 10 December 2015 and** by **KDHE on 16 November 2015**. (Appendix 4)

g. Coastal Zone Management (CZM) consistency/permit: No CZM issues were identified with the proposed project.

h. Other authorizations.

i. (☒NA) Significant Issues of Overriding National Importance. *Explain.*

8. Compensation and other mitigation actions.

a. Compensatory Mitigation.

(1) Is compensatory mitigation required? ☐ yes ☒ no [If "no," do not complete the rest of this section]

b. Other Mitigative Actions. Several mitigative actions are to be instituted and are included as special conditions of the permit. These primarily include spatial and temporal restrictions on dredging.

9. General evaluation criteria under the public interest review. I considered the following within this document:

a. The relative extent of the public and private need for the proposed structure or work.

Sand and gravel are essential components of concrete, asphalt, brick mortar, tile grout, and landscape materials. These materials are used to construct local, regional, and interstate roads and highways; public and commercial infrastructure; public, commercial, and industrial buildings and facilities; and residential housing developments. The use of sand and gravel as a constituent of construction materials is pervasive in the economy of the region that encompasses Kansas City metropolitan area and central Missouri. The relative extent of public and private need for the proposed work is more thoroughly discussed in Section 1.2 of the Final EIS and Section 2.7 of the ROD.

b. ☒There are no unresolved conflicts as to resource use.

c. The extent and permanence of the beneficial and/or detrimental effects, which the proposed work is likely to have on the public, and private uses to which the area is suited.

The beneficial and detrimental effects of the proposed action are discussed thoroughly across multiple Sections of the Final EIS and ROD. Overall, the benefits of the proposed action, while taking into account certain mitigative actions, outweigh the detrimental effects.

d. Special Conditions. I have concluded that inclusion of these special conditions are necessary to ensure that the project is not contrary to the public interest and otherwise comply with other federal laws and regulations.

The proposed dredging permits will include special permit conditions to ensure avoidance or minimization of impacts on environmental resources. Those special permit conditions are categorized as operational measures, resource protection zones, and compliance and monitoring measures. Section 4 of the Final EIS thoroughly discussions the potential impacts to the human environment from dredging. The following conditions were necessary

to ensure the LEDPA would not result in more than slight degradation in the short or long term, and to minimize impacts to the human environment.

Operational Measures

These conditions are necessary to ensure the regulatory action does not negatively interfere with the navigability of the Missouri River or impair its water quality.

a. If future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the USACE, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

g. Up to 10% of the permittee's authorized annual tonnage for each segment may be carried over each year to be extracted within that segment the following year. Annual tonnage with carryover may never exceed 110% of annual authorized tonnage of each segment. At the end of each year the permittee must notify OD-R of the Kansas City District, USACE in his annual tonnage report of any unextracted tonnage that he intends to carryover.

t. The permittee must discharge only suitable material that is free from toxic pollutants in other than trace quantities.

u. The permittee must investigate for water supply intakes or other activities which may be affected by suspended solids and turbidity increases caused by work in the watercourse and give sufficient notice to the owners of affected activities to allow preparation for any changes in water quality.

v. The permittee must employ measures to prevent dredged materials stored or disposed of on shore from running off or eroding into wetlands or tributaries to the Missouri River.

w. The permittee must employ measures to prevent or control spilled fuels or lubricants from entering the waters of the United States.

x. The permittee must store all construction materials, equipment, and/or petroleum products that are part of the on-shore operation, when not in use, above anticipated high water levels.

n. The permittee may discharge back into the Missouri River material spilled off the conveyer belts and unusable material separated out in the on-shore sand washing and handling facility. To subtract that tonnage from his annual extraction limit, the permittee must follow a plan approved in writing by OD-R of the Kansas City District, USACE.

This plan must show where and how the material will be discharged and how the amount of dredged material discharged back into the river will be measured and reported to OD-R of the Kansas City District, USACE. The total extraction tonnage will equal the tonnage extracted and barged to shore minus that amount intentionally returned to the Missouri River.

o. The permittee may return unwanted dredged material and river water (but not garbage) extracted from the Missouri River back to the Missouri River. The permittee must not dispose of waste materials, water, or garbage below the ordinary high water mark of any other water body, in a wetland area, or at any location where the materials could be introduced into the water body or an adjacent wetland as a result of runoff, flooding, wind, or other natural forces.

p. The permittee must comply with all U.S. Coast Guard, State of Missouri, State of Kansas (RM 367 to 490), and USACE regulations concerning the prevention of navigation obstructions in navigable waters of the United States.

q. The permittee must conduct operations in the Missouri River such that there will be no unreasonable interference with navigation.

Resource Protection Zones

Dredging can have a direct and immediate negative effect on various natural and manmade resources in the immediate area. To prevent or minimize these negative effects, dredging would generally be excluded in certain environmentally sensitive areas, in areas adjacent to certain infrastructure facilities, and in or near pallid sturgeon habitat. The specific resource protection zones within which dredging is prohibited are listed below. OD-R of the Kansas City District, USACE will provide the Dredgers with these resource protection zones in an electronic format that the dredge operator can use in the electronic dredge navigation system. This is for the ease and convenience of the Dredgers but the conditions below describing resource protection zones supersede any paper or electronic maps the USACE may provide. The dredge operator is responsible for determining that the dredge does not operate within these resource protection zones. The dredge location is documented with GPS, and compliance with the permit conditions will be documented in reports submitted to the USACE.

h. In permit conditions that specify a linear distance exclusion zone adjacent to a river feature, "dredging" refers to the operation of hydraulic cutter-head suction dredging. The exclusion zone distances will apply to and be measured from the end of the cutter head, rather than from a general point on the dredge.

i. The permittee must confine dredging to between the Rectified Channel Lines (RCL) with the following restrictions. Dredging must be conducted in such a manner to preserve the structural integrity of the landmass landward of the RCL. This must be accomplished by maintaining an adequate "no dredging or discharging" zone riverward of the RCL so

that material will stabilize into the dredging area at its natural angle of repose. This slope will vary depending upon river location and the type of material being dredged, but it is your responsibility to ensure that this shallow water interface landward of the RCL be maintained.

Levees, Pipeline Crossings, Dikes, and Bridges

Dredging too close to levees, pipelines, submerged utility crossings, bridge piers or abutments, dikes, revetments, water intakes, boat ramps, and natural river banks or islands, even at sustainable levels, can harm these structures either through direct physical contact or by undermining, exposing, destabilizing, or weakening these structures. The following condition is necessary to ensure that adverse impacts of the authorized dredging on navigation, flood control, and water intake structures and endangered species and their habitat are minimized.

j. The permittee must not dredge within 500 feet of any levee centerline, pipeline or submerged utility crossing, bridge pier or abutment; nor within 200 feet of any dike, revetment, or other structure built or authorized by the U.S. Government; nor within 100 feet of any normal bank line or island, without special authorization. When dredging is performed adjacent to river stabilization structures, the dredging may be conducted only in the present streambed of the river at the authorized locations. This condition represents only the minimum distances needed between dredging and structures and natural features and does not relieve the permittee from liability for damage arising from dredging. The permittee must be satisfied that dredging to these limits will not cause damage to public and private property.

Water supply

Dredging too close to water intake structures, even at sustainable levels, can harm these structures through direct physical contact; by undermining, exposing, destabilizing, or weakening these structures; and by negatively affecting water quality at the water intake. Dredging over horizontal collector wells can harm these wells by direct physical contact and by modifying the depth and physical characteristics of the river bed over the wells and negatively affecting the volume and quality of water pumped by the wells. The following conditions are necessary to avoid adverse impacts to existing municipal drinking water intake structures and provide a mixing zone sufficient to reestablish water quality to background conditions on the Missouri River; to preserve the existing permeable aquifer material and avoid adverse impacts to the horizontal collector wells; and to avoid adverse impacts to water intake structures and water quality of water users other than municipal drinking water providers.

j. The permittee must not conduct dredging operations in a zone extending 4,000 feet upstream and 500 feet downstream from any municipal drinking water intake structures located along either bank of the river unless he obtains an exemption to this condition in writing from the Regulatory Branch of the Kansas City District, USACE.

k. The permittee must not conduct dredging operations in a zone extending 1,000 feet upstream and 1,000 feet downstream from any municipal drinking water horizontal collector wells located along either bank of the river unless he obtains an exemption to this condition in writing from the Regulatory Branch of the Kansas City District, USACE.

l. The permittee must not conduct dredging operations in a zone extending 500 feet upstream and 500 feet downstream from any other water intake structures other than those used for municipal drinking water unless he obtains an exemption to this condition in writing from the Regulatory Branch of the Kansas City District, USACE.

Pallid Sturgeon Habitat and Cultural Resources

Previous dredging permit evaluations have determined that dredging in the specific locations authorized by those permits would not have any direct adverse effect on any cultural resources or endangered species. The Final EIS looked at a larger area of potential effect and identified various potential impacts that dredging could have on the endangered pallid sturgeon and on known and unknown but potential cultural resources throughout the Action Area if dredging caused more than slight bed degradation in the short and long term or if dredging expanded into areas not previously dredged. The first condition is a practicable measure that is necessary to ensure that adverse impacts of the authorized activity on cultural resources and the pallid sturgeon and its habitat are evaluated and minimized when dredging expands outside currently dredged reaches. The pallid sturgeon habitat protection zones listed on Table 5-1include specific areas where monitoring has most frequently found pallid sturgeon that could be directly impacted by dredging. The protection areas also include USACE shallow water habitat project sites that could be negatively impacted by dredging through physical disturbance and by removing coarse sediment from the bed load at locations where it is needed to form the sand and gravel bars in chutes that are a vital part of shallow water habitat. Table 5-1 will be reevaluated by the USACE and discussed with the Dredgers and the state and federal agencies each winter along with degradation conditions and trends indicated by the water surface profiles. The USACE and USFWS will also reevaluate the list when Dredgers request new or expanded dredging areas. At these times, habitat protection zones may be added for newly completed shallow water habitat projects or newly identified pallid sturgeon habitat areas; habitat protection zones may also be deleted if shallow water habitat areas have matured and/or no longer need protection from adjacent dredging.

r. To avoid impacting endangered species and cultural resources, the permittee must confine dredging to the specified reaches listed in their permits. If the permittee desires to expand or relocate his dredging operation outside the specified reaches, he must submit a request to the Regulatory Branch of the Kansas City District, USACE identifying the proposed new limits, in river miles, and the location of the unloading facility to be employed. Approval of the requests, if granted, will be provided in writing with modified reaches identified on the Missouri River Hydrographic Survey. Copies of the relocation requests must be furnished to the following agencies:

1. U.S. Fish and Wildlife Service, Columbia Field Office
2. Missouri Department of Natural Resources, Water Pollution Control Program
3. Missouri Department of Natural Resources, State Historic Preservation Office
4. Kansas Department of Health and Environment, Bureau of Water (for operations extending upstream of river mile 367)
5. Kansas State Historical Society, State Historic Preservation Office (for operations extending upstream of river mile 367)
6. Corps of Engineers, Kansas City District, Hydrologic Engineering Branch

s. Dredging is prohibited within the reaches identified the table below as pallid sturgeon habitat features:

Missouri River Miles (including 0.25-mile buffer)		
Downstream Limit	Upstream Limit	Habitat Feature
44.25	44.85	RDB Centaur Chute
49.15	50.05	RDB Centaur Chute
56.85	59.05	LDB Chute/Island
58.55	61.25	RDB Chute/Island
89.75	91.10	RDB Island
89.90	91.45	LDB Loutre Slough
91.20	93.55	LDB Lunch Island
103.00	104.95	Both Gasconade Confluence and Dike Field
105.20	106.25	RDB Dike Field
115.20	115.95	RDB Island
118.40	119.15	RDB Dike Field
119.35	119.85	RDB St. Albert Chute
124.35	124.95	RDB St. Albert Chute
126.05	126.90	LDB Dike Field
127.50	130.20	Both Osage River Confluence and Dike Field
157.00	158.45	LDB Island
176.40	178.35	LDB Island/RDB Tadpole Island Chute
180.15	180.65	RDB Tadpole Island Chute

Missouri River Miles (including 0.25-mile buffer)		
Downstream Limit	Upstream Limit	Habitat Feature
184.75	185.65	RDB Chute
186.90	188.20	RDB Chute and Dike Field
193.40	195.75	RDB Dike Field/Island
202.10	202.75	RDB Lamine River Confluence
210.00	219.65	Lisbon/Jameson Complex
226.95	227.55	LDB Little Chariton Confluence
238.40	239.10	LDB Chariton River Confluence
249.65	250.30	LDB Grand River Confluence
269.85	271.35	RDB Shallow/Island
280.40	282.05	RDB Island
297.90	299.05	RDB Island
300.00	301.05	LDB Island
367.00	367.75	RDB Kansas River Confluence
390.85	391.45	LDB Platte River Confluence
456.75	457.25	LDB Worthwine Chute
458.75	459.25	LDB Worthwine Chute
462.65	463.25	LDB Nodaway River Confluence
478.55	479.15	RDB Wolf Creek Confluence
494.55	495.20	RDB Big Nemaha River Confluence

Degraded Reaches

If dredging were not distributed more broadly and were allowed to remain concentrated around the existing sand plants, the level of future river bed degradation and associated direct and indirect impacts under these alternatives would be expected to be locally moderate to substantial. There would also likely be some loss of shallow water habitat in these areas of moderate to substantial bed degradation. The following condition is necessary to ensure that dredging results in no more than slight degradation throughout each river segment but particularly in the most severely degraded reaches near some existing sand plants.

f. No more than 300,000 tons of material shall be extracted within one year from each five-mile reach of the Missouri River between river miles 15 to 20, 25 to 35, 90 to 100, 140 to 150, 350 to 395, and 445 to 455. When the dredge report database of the Regulatory Branch of the Kansas City District, USACE indicates that extraction in a five-

mile reach has reached 300,000 tons, all Dredgers authorized to operate within that reach will be notified that it is closed to further dredging for the remainder of the calendar year unless a waiver is requested and received in writing from the Regulatory Branch of the Kansas City District, USACE.

Compliance and Monitoring Measures

The Final EIS and EA identified the Preferred Alternative which is that alternative that causes the least damage to the biological and physical environment and that best protects, preserves, and enhances historic, cultural, and natural resources. The USACE has concluded that the LEDPA, which is the Preferred Alternative with some adaptation due to practicability considerations, should result in no more than slight degradation throughout the LOMR in the short and long term. These conclusions were based on the use of the best available information and on interpretation of sediment transport equations and underlying data, the results of which include some level of uncertainty. While the results and the interpretation of the effects of bed degradation are based on the best currently available scientific data, sediment transport and estimates of previous bed degradation are indicators rather than precise predictors of future degradation. The following permit conditions are part of a process to monitor key variables in the LOMR system throughout the 5-year permit cycle and provide information needed to determine whether dredging levels or permit restrictions should be adjusted. Such a monitoring and reevaluation process will allow the uncertainty inherent in the modeling and analysis of bed degradation to be addressed. It also will reduce the risk of potentially significant impacts, increasing the confidence that adjustments could be made to address impacts while they are relatively small. The permit conditions are also necessary to ensure that the Dredgers comply with the conditions restricting where and how much material may be dredged.

b. The permittee must implement a Dredge Monitoring Plan (DMP) approved by the Regulatory Branch of the Kansas City District, USACE. If a DMP has not been previously approved by the Regulatory Branch, USACE, Kansas City District, the permittee must provide within 30 days of execution of the permit a DMP for each individual dredge plant to the Regulatory Branch of the USACE, Kansas City District for approval. The DMP must show how the permittee will monitor, record, and report the cutter-head position, cutter-head operating status, extraction tonnage, and the presence of any hard substrates, mussel shells, or unusual concentration of gravel in an impartial, unbiased, reliable, and accurate manner. The DMP must include the specifications of the process and the Dredge Monitoring System (DMS) including sensors, hardware, software, communications devices the permittee will use to: gather data; perform quality control on those data; calibrate, test, and repair sensors when they fail; and transfer the data to the Regulatory Branch of the Kansas City District, USACE. The DMS must include automated differential Global Positioning System (DGPS) equipment (or other comparable system) operating with a minimum accuracy level of 1-3 meters horizontal Circular Error Probable with horizontal positions tied into the UTM Zone 15 NAD 83 (feet) coordinate system recorded to the nearest foot. The DMS must always be on,

recording cutter-head position and operating status every 5 minutes, 24-hours a day, 365 days a year, even when the dredge is not operating. The data logged each month must be submitted by email matthew.c.sailor@usace.army.mil at the Regulatory Branch of the Kansas City District, USACE by the 7th day of the following month. If the permittee does not receive an email confirmation that the report was received, the permittee must contact the Regulatory Branch of the Kansas City District, USACE at 816-389-3990 for revised instructions for filing the monthly report. The extracted material must be measured by one of the methods described in the Standard Operating Procedure for Hydrographic Surveying and Dredge Monitoring attached to your permit. If the tonnage is measured by scale at the off-loading facility, the DMP should also describe how the operation will record the date, time, river mile, coordinates, and approximate tonnage of each barge loaded in one location. If a barge is partially filled at one anchor setting then completed at a new anchor setting, the tonnage should be estimated separately for each location. This information must be provided monthly by email on the attached Missouri River Commercial Dredging Location/Volume Report spreadsheet to matthew.c.sailor@usace.army.mil at the Regulatory Branch of the Kansas City District, USACE by the 7th day of the following month. If the permittee does not receive an email confirmation that the report was received, the permittee must contact the Regulatory Branch of the Kansas City District, USACE at 816-389-3990 for revised instructions for filing the monthly report. Faulty sensors or other components identified in the DMP must be repaired within 96 hours. The DMS must not be inoperable more than 5 percent of the time. The permittee must install an approved DMS and have it inspected by the Regulatory Branch of the Kansas City District, USACE (or St. Louis District) within 120 days of execution of the permit or the permittee must cease dredging operations until it is installed and inspected or the permittee submit a justification of the delay and an installation schedule and get an extension of this deadline in writing from the Regulatory Branch of the Kansas City District, USACE (or St. Louis District).

c. The USACE periodically surveys the river as part of the management and operation of the Bank Stabilization and Navigation Project. If, for any reason, the USACE has not surveyed the river in the fourth year (2019) of the five-year permit cycle, the authorized dredging companies must have the lower 498 miles of the LOMR surveyed during the summer months in accordance with the Standard Operating Procedures for Hydrographic Surveying and Dredge Monitoring. The survey shall be completed between June and September of 2019 and submitted to the USACE by November 1, 2019.

d. If any part of the authorized work is performed by a contractor, before starting work the permittee must discuss the terms and conditions of this permit with the contractor and must give a copy of this entire permit to the contractor. After the initial 120 days of this permit, any contracted dredges or barges must also be equipped with and operate in accordance with an approved DMP as required in Special Condition "b". The DMP and system must be approved by the Regulatory Branch of the Kansas City District, USACE prior to starting work.

e. Until the dredges and barges are equipped with the DMS required by Special Condition

"b", the permittee must, for each dredge operated, record Global Positioning System (GPS) coordinates, tons of material removed, and the presence of any hard substrates or unusual concentration of gravel daily. If the dredge moves more than 100 feet in any one day then the amount of material removed from each location must be recorded separately. The operators may use hand-held GPS devices or automatically recording devices, but with which ever system used, must identify the device make/model and recording location. This information must be recorded on the attached Missouri River Commercial Dredging Location/Volume Report in an electronic spreadsheet. The permittee must furnish a copy of the completed monthly report by email to matthew.c.sailor@usace.army.mil at the Regulatory Branch of the Kansas City District, USACE by the 7th day of the following month. If the permittee does not receive an email confirmation that the report was received, he must contact the Regulatory Branch of the Kansas City District, USACE at 816-389-3990 for revised instructions for filing the monthly report.

10. Determinations.

a. Public Hearing Request: ☐NA

☒ I have reviewed and evaluated the requests for a public hearing. There is sufficient information available to evaluate the proposed project; therefore, the requests for a public hearing are denied in a memorandum dated 7 October 2015. See Section 3(d)(1) of this document for an account of the USACE's final determination.

b. Section 176(c) of the Clean Air Act General Conformity Rule Review: The proposed permit action has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined that the activities proposed under this permit will not exceed de minimis levels of direct or indirect emissions of a criteria pollutant or its precursors and are exempted by 40 CFR Part 93.153. Any later indirect emissions are generally not within the Corps' continuing program responsibility and generally cannot be practicably controlled by the Corps. For these reasons a conformity determination is not required for this permit action.

c. Relevant Presidential Executive Orders (EO).

(1) EO 13175, Consultation with Indian Tribes, Alaska Natives, and Native Hawaiians. ☒ This action has no substantial direct effect on one or more Indian tribes.

(2) EO 11988, Floodplain Management. ☒ Alternatives to location within the floodplain, minimization, and compensation of the effects were considered above.

(3) EO 12898, Environmental Justice. In accordance with Title III of the Civil Right Act of 1964 and EO 12898, it has been determined that the project would not directly or through contractual or other arrangements, use criteria, methods, or practices that discriminate on the basis of race, color, or national origin nor would it have a disproportionate effect on minority or low-income communities.

(4) EO 13112, Invasive Species.

☒ There were no invasive species issues involved.
☐ The evaluation above included invasive species concerns in the analysis of impacts at the project site and associated compensatory mitigation projects.
☐ Through special conditions, the permittee will be required to control the introduction and spread of exotic species.

(5) EO 13212 and 13302, Energy Supply and Availability. ☒ The project was not one that will increase the production, transmission, or conservation of energy, or strengthen pipeline safety.

d. Finding of No Significant Impact (FONSI). Having reviewed the information provided by the applicants and all interested parties and an assessment of the environmental impacts, I find that this permit action will not have a significant impact on the quality of the human environment. Therefore, a Supplemental Environmental Impact Statement will not be required, however, an EA was prepared to evaluate an alternative not evaluated in the Final EIS for the Waverly Segment. The evaluation within the Waverly EA also concluded with a FONSI.

e. Compliance with 404(b)(1) guidelines. Having completed the evaluation in paragraph 5, I have determined that the proposed discharge ☒ complies/☐ does not comply with the 404(b)(1) guidelines.

f. Public Interest Determination: I find that issuance of Department of the Army permits to Capital Sand Company, Inc. (NWK-2011-00361), Hermann Sand & Gravel, Inc. (NWK-2011-00362), Holliday Sand & Gravel Company (NWK-2011-00363), Con-Agg of Missouri, LLC. (NWK-2011-00364), Limited Leasing Company (MVS-2011-00177), and J.T.R., Inc. (MVS-2011-00178) as prescribed by regulations published in 33 CFR 320-332, is based on a thorough analysis and evaluation of the various factors enumerated above; that there are no reasonable alternatives available to the applicant that will achieve the purposes for which the work is being constructed; that the work is in accordance with the overall desires of the public as reflected in the comments of state and local agencies and the general public; that the work is deemed to comply with established state and local laws, regulations, and codes; that there have been no identified, significant, adverse environmental effects related to the work; that the issuance of these permits is consonant with national policy, statutes, and administrative directives; and that on balance the total public interest should best be served by the issuance of the Department of the Army permits. Therefore, I find that this decision is not contrary to the public interest.

PREPARED BY:

Date: 2015-12-10

Matthew C. Sailor
Project Manager

REVIEWED BY:

Date: 2015-12-10

David R. Hibbs
Regulatory Program Manager

REVIEWED BY:

Date: 2015-12-10

Mark D. Frazier
Chief, Regulatory Branch, Kansas City District

APPROVED BY:

Date: 12/10/15

Stuart R. Cook
Chief, Operations Division, Kansas City District

Appendices Index

1. Public Notice dated 13 March 2015
2. Public Comments
3. Agency Comments
4. Missouri and Kansas Water Quality Certifications
5. Biological Assessment
6. Engineering Division Memos dated 10 November 2015
7. Waverly Environmental Assessment
8. Response and Rebuttal Letter dated 8 May 2015
9. Dredgers Rebuttal Letter dated 31 August 2015
10. Holliday Sand Rebuttal Letter dated 18 September 2015
11. Engineering Division Memo dated 14 July 2015
12. USFWS Concurrence
13. SHPO Concurrence
14. Public Hearing Denial Memo dated 7 October 2015