Appendix 10

Holliday
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September 18, 2015

VIA EMAIL

Matthew Sailor, Regulatory Project Manager
David R. Hibbs, Assistant Chief, Regulatory Branch
U.S. Army Corps of Engineers
Kansas City Regulatory Office
601 East 12th Street, Room 402
Kansas City, MO 64106

Re: Missouri River Dredge Permit - Response to Public Notice Comments by U.S. Environmental Protection Agency, Region 7

Gentlemen:

Holliday Sand & Gravel Company, LLC ("Holliday") appreciates the opportunity to respond to the public comments received on the proposed renewal of its Missouri River dredging permit. Holliday believes that the proposed permit and the USACE's February 2011 Missouri River Commercial Dredging Environmental Impact Statement (the "EIS") and March 2011 Commercial Sand and Gravel Dredging on the Lower Missouri River Record of Decision (the "ROD") already address the the comments received from Region 7 of the U.S. Environmental Protection Agency ("EPA"), but also believes that EPA's comments can be further explained and supported based on information provided here that has been developed by the USACE and Holliday since the issuance of Holliday's current permit in 2011. This letter also serves as a supplement to the August 31, 2015, response provided to the USACE's May 8, 2015 request for rebuttal information provided by David Shorr, Lathrop and Gage LLP, on behalf of the Missouri River dredgers as a group.

Following, we present the EPA's comments (italicized) that applied to Holliday, and after each the corresponding response.

EPA Region 7 comments on the Missouri River Dredging Public Notices

"The EPA's National Environmental Policy Act and Clean Water Act Section 404 Regulatory staff have reviewed and coordinated the following comments on the Missouri River Dredging Public Notices including:

> *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*)*

Comparing the Proposed Dredging Totals (Public Notice Table 3) to limits in the 2011 permit and Record of Decision there are several increases proposed:

Waverly Segment:

ROD Allowable: 1,140,000 t/year

Proposed: 1,140,000 t/year in 2016 (Holliday and

Capital) Increase after 2016.

2017 through 2020 exceeds ROD allowable maximum for segment."

Holliday's response:

To prevent significant negative economic impacts to the region's construction industry during the next five year permit cycle, Holliday has requested that its tonnage allocation in the Waverly Segment (downstream of the Blue River) be modestly increased an average of 4% each year to meet the anticipated increase in construction market demand.[1] If the demand is not there, the increased quota will not be dredged.

The Waverly Segment of the Missouri River has been aggrading, has very limited structural risk, and this type of a modest increase in dredging will not contribute to degradation impacts upstream in Kansas City (KC). We have calculated a net deposition (based upon information

[1] Tonnage requested by Holliday in this permit cycle per year:
2016 = 770,000 tons (no change)
2017 = 847.000 tons (+10% above 2016)
2018 = 924,000 tons (+9% above 2017)
2019 = 1,001,000 tons (+8.3% above 2018)
2020 = 1,078,000 tons (7.6% above 2019)
Total increase over the 5-year period = 4,620,000 - 3,850,000 = 770,000 tons (20% total increase)

provided by the USACE) of approximately 1.1MM tons in the upper Waverly Segment, **from** RM 345 to 357, from 2009 to 2013 .[2] Considering the historic 2011 scouring event that **caused** abnormal degradation, this continuing trend of aggradation clearly shows a stable and aggrading reach, even under the worst conditions.

Providing this additional tonnage allocation is also consistent with the analyses contained in the 2011 EIS and decisions outlined in the USACE accompanying ROD.
Holliday and Capital Sand Company each requested additional tonnage in the stable to aggrading Waverly Segment in comments each made to the EIS. At that time, thehe USACE stated:

> "The USACE cannot increase the annual limit in the Waverly segment because the Final EIS (USACE 2011) did not consider an alternative with a higher annual extraction limit. **However, in the next permit cycle the USACE may be able to increase the annual extraction limit in the Waverly segment if the segment continues to be stable or aggrading under Alternative B during the next five years."**
> ROD at Section 4, Alternative Analysis.

In the ROD, the USACE then selected Alternative B in Waverly, not because the EIS mandated it as the maximum "allowable" tonnage in Waverly, but because it was the alternative that provided the greatest tonnage. Alternative C, which was defined as the Existing Conditions, the recent annual averages dredged by the applicants for the years 2004 to 2008, was actually less tonnage than Alt B because Holliday had neither the reason to request nor a reason to dredge more tons further downstream in Waverly during those years, as the KC segment quota prior to the EIS was more than ample.

With the transition to Alternative A in the KC segment, the tonnage allotment for Waverly was increased for Holliday to the maximum amount proposed in the EIS based upon existing data (Alternative B), while granting Alternative C (status quo) to Capital Sand. The EIS determined that the Waverly segment is stable to aggrading, and significantly, USACE's ROD stated that if future monitoring confirmed that Waverly remained stable, they would likely add tonnage beyond the Alternative B level for the next permit cycle (see ROD response above). Further, Alternative B was defined in the EIS as the preferred dredging volume applied to segments that could sustain moderate degradation of 2 to 4 feet. Moderate degradation of 2 to 4 feet has not been the case for the still stable to aggrading Waverly segment and therefore, based upon the analysis of the EIS and the ROD, the existing Alternative B tonnage level can be increased to the levels requested by Holliday to meet Holliday's anticipated demand.

Again, it is important to emphasize that the risk of any environmental impacts is low based upon the location of the Waverly segment. The EIS, at Chapter 2, Section 3.5.1.2, page 2-88 states:

> "The Waverly segment has shown limited overall bed degradation in the last 20 years and

[2] We calculated that 0.75 feet average aggradation multiplied by 500 foot width between dikes, by 12 miles long by 90lb/ft^3 is approximately 1.1 million tons of sediment aggradation. See *2015 Annual Missouri River Dredgers Update Meeting*, February 9, 2015, Powerpoint Slide 18, *Average River Bed Change*

has lower potential for impacts to environmental and human environment resources resulting from bed degradation."

Therefore, the increased tonnage amount requested by Holliday is consistent with the existing EIS and ROD, and does not suggest any unanticipated environmental impacts..

Recent Survey Results for Upper Waverly and Lower KC Segments

Comparison of river cross section surveys completed in 2009, 2012, and 2013 by the USACE indicate that the channel bed of the Missouri River has actually aggraded (material has deposited) from River Mile 325 to RM 370, and throughout the 107 mile segment. This information was presented by the USACE at the 9 February 2015 meeting - see *2015 Annual Missouri River Dredgers Update Meeting*. This reach of river includes where Holliday has been dredging sand for construction materials over the same time period. The average bed aggradation through this upper reach over the 2009 through 2013 time period is approximately 0.5 feet, which is remarkable as it includes the time period of the record sustained high flow release in 2011.

The average slope line of the construction reference plane water surface profile has also increased approximately 0.5 feet through this reach over this same time period. This bed aggradation represents approximately 2.5 to 3.0 MM tons of bed material deposition in this reach over this 3 to 4 year time period. The Dredger's sponsored survey in 2014 and USACE's bed change report presented on July 7, 2015, confirmed that much of this bed recovery actually occurred after the high flow event in 2011. In summary, both channel bed and associated water surface elevations have increased in this reach with a combination of ongoing dredging by Holliday within the regulatory limits and an extremely high flow event in 2011.

EPA Region 7 comments on the Missouri River Dredging Public Notices (cont'd.)

"The applicants propose no increases in permit limits for the St. Joseph and Kansas City segments, although currently authorized amounts for both segments are the maximum allowable under the 2011 ROD. The applicants propose no increase in permit limits for the Waverly segment for 2016, but Holliday proposes increasing amounts from 2017 through 2020 well in excess of the allowable amount. Under the 2011 ROD, the allowable amount of dredging constituted a 40% increase over previous dredging. We are concerned that a permitted increase above the 2011 allowable increase could change what has been an aggrading segment into a degrading segment."

Holliday's response:

The EIS based dredging intensity on the percentage of tons dredged versus the bed material load in tons. Holliday's maximum proposed increase in dredging in the Waverly segment would ramp up to 308,000 tons in year 2020 (reaching 1,078,000 tons per year). This

represents a 40% increase from the present 770,000 ton limit, but is still only 22% of the estimated Waverly 4,956,000 average annual tons bed material load calculated in the EIS for the years 2000-2009. (EIS p. A-96, Table A-21)[3]

Again, Holliday believes that the flow period from 2000-2009 was dominated by the record system drought which occurred from 1999-2007, making this estimate of the bed load very conservative and likely to be exceeded with normal occurrence of greater flows. As explained by the EIS:

> "Bed material load estimates were extrapolated between stations for the Waverly and Jefferson City segments as a gage with sediment data was not available in these segments. The average annual bed material load estimates used in the impacts analysis were based on below-average flow conditions from 2000 to 2009, which represent a worst-case scenario for estimating impacts." Final EIS page 4.2-8.

Comparison with other Segments

By comparison, the EIS determined and the ROD approved Alternative C (Existing Conditions) dredging levels in Jefferson City and St. Charles even though that represented dredging 37% and 45% of the bed load, respectively, and would result in moderate to substantial degradation in the long term near Jefferson City and St. Charles. EIS, pp. 4.2-.12, Summary Table 4.2, Existing Conditions.

With regard to EPA's comment that *"We are concerned that a permitted increase above the 2011 allowable increase could change what has been an aggrading segment into a degrading segment,"* Holliday believes that this is a misleading assertion that is inconsistent with the EIS and ROD. Holliday submits that river dredging has significant benefits and the absence of suitable alternatives (for providing materials that are vital to the construction and maintenance of the region's infrastructure) makes dredging essential to the public and as such, the stated goal of the EIS was to determine sustainable levels of dredging that would not cause detrimental impacts. The goal was neither to reduce nor to eliminate dredging if there was *any* degradation, and neither was the goal to eliminate nor to reverse degradation.

Specifically, the Environmentally Preferred Alternative (EPALT), as stated in the EIS is:

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[3] Note that the 22% dredged does not include the Capital Sand requested increase of 330k tons over five years, representing an increase of 89% from their current level of 370K tons. The two companies' combined maximum dredge tons (1,778,000 tons) would be 36% of the bed load – still considerably less than at Jefferson City or St. Charles as noted below.

"It was determined that the Environmentally Preferred Alternative should be the highest annual dredging amount that would result in no more than slight degradation, or less than approximately 2 feet in the short term and long term in each segment."
EIS, Section 2.7.3, p. 2-86.

EPA Region 7 comments on the Missouri River Dredging Public Notices (cont'd.):

"Applicant proposals for the St. Joseph and Kansas City segments are for quantities currently permitted and constitute the maximum allowed under the 2011 ROD. We recommend the Corps confirm that those levels are not causing further degradation within each segment using data collected since 2011."

"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. We consider the current approach of monitoring for river bed loss while adjusting permitting quantities every permit cycle to be a temporary and inefficient means of regulating this activity."

Holliday's response:

Holliday believes that the above request by EPA has been already completed within the Dredging EIS and has been confirmed by reliable field data collected by USGS sediment measurements.

The US Geological Survey (USGS) measures suspended bed material sediment discharge on the Missouri River at Kansas City and summarized annual bed material sediment loads in their report *Characteristics of Sediment Data and Annual Suspended Sediment Loads and Yields for Selected Lower Missouri River Mainstem and Tributary Stations, 1976-2008.* For the time period from 1995 through 2006 (years that included an extreme drought), the **USGS reports that approximately 11.7 million tons per year of bed material sediment (very fine sand or coarser material) is transported by the Missouri River through Kansas City.**[4] This quantity of sediment load is at least 10 times greater than the bed material sediment dredged by Holliday on an annual basis since 2009, indicating that the ambient background sediment inflow to this reach adequately and sustainably replenishes the bed material sediments extracted through ongoing dredging operations.

The EIS has already identified sustainable levels of dredging by evaluating what percent of the bed load (sediment budget) should be dredged without significant increases to bed degradation. The EIS and subsequent studies show that sediment transport depends largely on flow and velocity and therein lies the inherent inaccuracy of a standardized sediment budget as flood and high flows transport the most sediment and have the greatest impact on the river bed but are

difficult to accurately quantify, predict or budget. This is but one reason that ongoing adaptive management is superior to a set sediment budget. Indeed, based solely on a sediment budget (11.7MM tons per year according to the USGS), it would seem the USACE took very drastic steps in reducing the KC segment allocation to 540K tons per year.

EPA Region 7 comments on the Missouri River Dredging Public Notices (cont'd.)

"Clean Water Act Compliance
The applicant must demonstrate the need for the project. EPA believes that the project does not meet the requirements under 230.10(a-d) of the Section 404(b)(l) Guidelines."[5]

Holliday's response:

As further described below, this blanket assertion by EPA is completely unsupported by the administrative record for the Missouri River dredging permitting, as memorialized in the ROD. In particular, the ROD contains a 22 page 404(b)(1) Guidelines analysis, replete with references to the EIS, that substantiates the agency's Least Environmentally Damaging Practicable Alternative (LEDPA) conclusion. *See* ROD at § 5. Indeed, as described in the ROD, the USACE's jurisdiction over Holliday's dredging activities almost entirely arises under Section 10 of the Rivers and Harbors Act; only a very minor aspect of the dredging, the return of off-specification sand and water back into the river, is regulated under CWA Section 404 and thereby subject to 404(b)(1) analysis. *See* ROD at § 2.2. Nevertheless, not only did the USACE already thoroughly evaluate these Section 404 discharges in the EIS and the ROD, but the agency also conservatively included in the analysis the Section 10 activities connected to the discharges—the extraction of sand and gravel through dredging.

EPA Region 7 comments on the Missouri River Dredging Public Notices (cont'd.)

"Alternatives Analysis-40 CFR 230.10(a)

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[5] Contrary to the USACE's characterization of EPA's comments contained in the USACE's May 8, 2015, request for rebuttal, EPA does not assert that the Missouri River dredging operations are not water dependent; rather, EPA claims that the alternatives analysis did not include a reasonable range, including potential upland mining. As noted, the EIS contained a thorough analysis of five alternatives and the impacts associated therewith, three of which included the utilization of alternate sources of sand and gravel, including potential upland sources. *See* Missouri River Commercial Dredging Final EIS, Chapter 4. Furthermore, even if EPA was making such an assertion, water dependency is not ultimately determinative of which alternative satisfies the USACE's review criteria, it is what the USACE determines to be LEDPA after weighing numerous additional factors, such as public interest. Moreover, as stated correctly by the USACE in the ROD, water dependency is not relevant to this analysis because "no discharges of dredged or fill material into special aquatic sites are proposed or are authorized in this decision." ROD at § 2.3.3.

Alternatives
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 instability, headcutting, and related channel effects from dredging activities to the River and its tributaries."

Holliday's response:

The EIS contained a comprehensive alternatives analysis that included a detailed evaluation of five alternatives and the impacts associated therewith, three of which included the utilization of alternate sources of sand and gravel, including potential upland sources. See EIS, Chapter 4. The analysis also included the variations noted by EPA (quantities, depth, methodologies, locations). *Id.* The USACE's alternatives analysis more than satisfies the "reasonable range" required under the National Environmental Policy Act and USACE and EPA regulations. Based on this thorough analysis and the USACE's application of its own and EPA's review criteria, the agency identified the LEDPA which was memorialized in Holliday's permit.

It is noteworthy that regarding alternate dredging locations (creeks, flood plains and the Kansas River), Holliday has commented extensively to the USACE regarding the reasons for a lack of alternatives for Missouri River dredging. For example, for land-based sand pits the problems include: lack of land availability, proximity to levees and water wells, trucking access, excessive waste fines, and high hauling costs, all of which have significant adverse impacts. If there were feasible, let alone practicable, alternatives for river dredging, Holliday and the other major sand suppliers would certainly be doing it.

It is further worth noting that in regard to headcutting, it is a common misconception that dredging results in a "headcut" (an upstream progression of local scour) on the Missouri River. The impact to the river bed from dredging is downstream of the dredge hole. This was clarified in the EIS:

On page 4.2-12 of the EIS, last paragraph, it states:

> "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."**

EPA Region 7 comments on the Missouri River Dredging Public Notices (cont'd.)

"Least Environmentally Damaging Practicable Alternative
The LEDPA for the proposed project has not been identified. There are likely less damaging practicable alternatives, it is likely that the proposed project is not the LEDPA. Sand can also be mined outside of Waters of the U.S. and may ultimately be the LEDPA. The sustainable amount of sediment that can be mined needs to be determined."

Holliday's response:

See the response above regarding the lack of a practicable alternative and the USACE's analysis thereof. Because there is no practicable alternative, the LEDPA is river dredging at sustainable levels in locations where slight degradation can be tolerated without significant impacts. The LEDPA has been identified through a thorough analysis by the USACE, and that conclusion has found nothing but additional support in the bed degradation and sediment load information that has been generated since the USACE's original 2011 analysis.

EPA Region 7 comments on the Missouri River Dredging Public Notices (cont'd.)

"Compliance with other Environmental Standards- 40 CFR 230.10(b)
Water Quality and Toxic Effluent standards
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. A recent visit ***on one of the tributaries*** *to the Missouri river by FWS past an active dredging site on the river indicated that the activity was causing unsightly color and turbidity, and may be inducing physical, chemical, or hydrologic changes that would impair the natural biological community. It may be less damaging to sort material off river and allow fines to settle before being the process water is discharged back to the river."*

Holliday's response:

As part of the EIS, Holliday performed extensive water quality tests of river water ahead of the dredge as compared to below the active dredge prior to implementing dredging near drinking water intakes. There were no measureable changes to water quality. It appears that EPA's comment may be referring to tributary dredging and not dredging on the Missouri River itself. Tributaries are often mud–bottom rivers whereas the Missouri River has removed the upper muddy layers resulting in a sandy bed. The expert agencies regarding water quality

and biological matters associated with dredging on the Missouri River, the Missouri Division of Environmental Quality ("MDEQ") and the U.S. Fish and Wildlife Service ("USFWS"), have evaluated and addressed such issues and authorized Holliday's dredging through the agencies' respective authorities under Section 401 of the CWA and the federal Endangered Species Act ("ESA").

EPA Region 7 comments on the Missouri River Dredging Public Notices (cont'd.)

"Endangered species
The project could jeopardize the continued existence of habitat for state and federally listed endangered species. We encourage the Corps to condition the permit based on the comments of the Missouri Department of Conservation, Kansas Department of Wildlife Parks and Tourism, and USFWS to assure that endangered species are being protected."

Holliday's response:

Holliday and the other Dredgers together have contracted with Cardno-Entrix to update the endangered species biological report and said update has been submitted and reaches the same conclusions as those reached by the USFWS in its analysis of the prior permit applications.

EPA Region 7 comments on the Missouri River Dredging Public Notices (cont'd.)

"Significant Degradation-- 40 CFR 230.10(c)

EPA 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."

Holliday's response:

Responsible dredging as practiced by Holliday as authorized by the USACE does not degrade water quality. This fact explains why, as noted above, the expert agencies on these matters, the USFWS and MDEQ, have approved USACE's issuance of Holliday's permit as compliant with the ESA and CWA Section 401, respectively. River dredging has provided a sustainable source of high quality and low cost fine aggregate across the state of Missouri and

eastern Kansas. Flood plain alternatives have the potential for significant adverse impacts and are not sustainable.

EPA Region 7 comments on the Missouri River Dredging Public Notices (cont'd.)

"Human health and welfare
Safety to boaters should be considered during dredging, and where/how the equipment is stored as to not interfere with navigation."

Holliday's response:

Holliday's dredges have appropriate USCG signage and lights. Dredge cables are buoyed for visibility to boaters. Dredges and barges are never moored in the navigation channel. These actions are approved by the USCG. Dredgers have a history of supporting recreational events and assisting with rescue, recovery and other emergencies. Holliday is essentially the only full time presence on the Missouri River when assistance is needed in KC.

EPA Region 7 comments on the Missouri River Dredging Public Notices (cont'd.)

"Avoidance, Minimization, and Compensation-- 40 CFR 230.10(d)
The EPA 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 EPA 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."

Holliday's response:

Holliday disagrees that avoidance, minimization and compensation have not been applied to the dredgers, especially Holliday in KC. The following are examples of how impacts were mitigated during this first post-EIS permit cycle and there is data to back up the results (which is extremely reassuring considering the historic 2011 releases and channel flow event).

As a result of the Dredging EIS the USACE has mandated:

- Reduced dredging tons in the KC segment by 79%
- A maximum tonnage for each 5 mile reach (resulting in dredging up to 10 miles

further from KC)

- Dredge recording devices for tonnage and exact location
- Mile long no-dredge zones at drinking water intakes
- 500 foot setbacks from all levees (even non-federal agricultural levees)
- 500 mile River bed elevation survey for every permit cycle
- Further tonnage restrictions if response to excessive degradation is warranted

There are significant costs for these changes, and thus equity dictates that modest increases in dredging should be authorized if the river aggrades and there is an economic need for the product consistent with the purpose and need for the proposed action. This is consistent with the adaptive management strategies adopted by the USACE.

The recent Dredger's 500 mile river survey performed for 2014 demonstrated that the river has recovered approximately two-thirds of its bed loss (in the St. Joe segment upstream of KC) from the historic 2011 reservoir discharge event and is expected to recover more. This data was presented to the Dredgers by the USACE on July 7, 2015, as part of the permit process. Net aggradation in the Kansas City and Waverly segments during the last dredge permit cycle was also presented by the USACE, and substantiated for by our nationally recognized water resources experts (see the attached Technical Memo). USACE also reported that since 2009 there has been no correlation between degradation and dredging, and the Waverly segment, where increased tonnages have been requested, aggraded an average of 0.30 feet over 107 miles of river (equivalent to approximately 4MM tons of bed material).

EPA Region 7 comments on the Missouri River Dredging Public Notices (cont'd.)

"Conclusion
It does not appear that 40 CFR 230.12(a)(3)(iv) is currently being met as there is not sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with the 404(b)(l) Guidelines. The burden of proof to demonstrate compliance with the Guidelines rests with the applicant; where insufficient information is provided to determine compliance, the Guidelines require that no permit be issued."

Holliday's response:

As described above and memorialized in the EIS and the ROD, and the extensive associated administrative record, more than sufficient information supporting the USACE's issuance of Holliday's current permit existed at that time, and exists now, in support of the USACE's reissuance of a permit per Holliday's pending application. Moreover, as described above and in the attached Technical Memorandum, significant additional information has been generated

since 2011 that further illustrates that the USACE's LEDPA conclusion and adaptive management approach towards Missouri River commercial sand and gravel dredging was and remains well-founded.

In closing, Holliday is committed to assuring that 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 and in accordance with the natural delivery of bed material sediment that the Missouri River provides.

Sincerely yours,

Holliday Sand & Gravel Company

Mike Odell

Vice President – Operations

Enclosure:

Technical Memorandum – Analysis of Sediment Transport and Hydraulic Data in Support of Holliday Sand and Gravel 2015 Dredge Permit Renewal

TECHNICAL MEMORANDUM – ANALYSIS OF SEDIMENT TRANSPORT AND HYDRAULIC DATA IN SUPPORT OF HOLLIDAY SAND AND GRAVEL 2015 DREDGE PERMIT RENEWAL

INTRODUCTION

Northwest Hydraulic Consultants (NHC) and David T. Williams and Associates (DTW) were retained by Stoel Rives, LLP to provide technical assistance and expert opinion to Holliday Sand and Gravel (Holliday) in support of permitting and compliance activities of Holliday's sand dredging operations on the Missouri River. Concerns regarding reduced water surface elevations at low flow conditions have been raised, due to potential impacts to surface water diversion facilities and operations. To address these concerns, NHC and DTW reviewed measured stage discharge records published by the USGS to assess measured changes in low flow stage conditions in Kansas City.

Principal representatives of NHC and DTW, Brad Hall and David Williams, respectively, have previously reviewed and commented extensively on the U.S. Army Corps of Engineers, Kansas City District's (USACE) ongoing Missouri River Degradation Study and mobile bed modeling activities completed in conjunction with these studies. DTW and NHC submitted a Technical Memo to the USACE in November 2014 providing detailed comments regarding the validity of the assumptions, methodologies, and results reported by the USACE in their Missouri River Bed Degradation Study Mobile Bed Model Calibration Report, dated February 2014. NHC also attended the USACE dredge permit review meetings and presentation held in Kansas City and Jefferson City in February and July 2015, respectively. Earlier meetings were attended by either or both Mr. Hall and Dr. Williams at USACE, dredging community, and other stakeholder meetings in December 2013, February 2014, April 2014, September 2014, and January 2015. Through these meetings, Mr. Hall's and Dr. Williams' individual experience working for and with the USACE, and our other river engineering expertise, NHC and DTW have developed an appreciation of the range of interest of various stakeholders, a solid understanding of the physical system, its geomorphic history and evolution, and the processes by which sand dredging could impact sediment dynamics on the Missouri River.

We reviewed the USACE and EPA comments to Holliday's dredging permit renewal application for Calendar Year (CY) 2015 through 2020. In partial response to these comments, we completed an analysis of the measured stage over time as recorded by the US Geological Survey as part of their gaging activities at Kansas City (USGS 06893000) and Waverly (USGS 06895500), Missouri. A summary of this analysis of USGS published and measured data is provided in this technical memorandum in support of Holliday's application for continued sand dredging on the Missouri River.

STAGE AND DISCHARGE MEASUREMENTS AT KANSAS CITY AND WAVERLY

We reviewed and analyzed the records from the USGS for the Kansas City and Waverly stream gages to look at trends in measured stage and discharge at these gages from January 2008 through December 2014, of which the latter date is the extent of the published data at the time this analysis was

completed. The initial date was chosen to capture an equivalent time period prior to the high flow year of 2011. From this data we completed a specific gage analysis to assess temporal trends in the stage versus discharge data. Details of these analyses are provided below.

Stage Discharge Rating Curve

The USGS conducts a discharge measurement at the Kansas City and Waverly gages several times per year (20+ at these gages) where they record the measured water surface stage and then measure the stream velocity and associated flowrate with either a velocity meter or ADCP (Acoustic Doppler Current Profiler) instrument. From these measurements, the USGS develops a stage versus discharge rating curve for the gage. The USGS then uses this rating curve to develop flowrates as a function of stage for time periods in between when these measurements are taken. The USGS continuously records river stage and then uses the rating curve to estimate flowrate, which then can be reported as instantaneous, or typically as a daily average value. The USGS looks for "shifts" in the rating, i.e., has the stage increased or decreased significantly for a given flow over time, and if so, they would update the rating curve for publishing measured daily discharge values.

These measured values of stage and discharge are shown below on Figures 1 and 2 for the Waverly and Kansas City gages, respectively. The data for each year is shown as a different symbol. The 2015 rating curve published by the USGS for each gage is shown for comparison with the measured data. Visually, the data scatter around the rating curve is small for the Waverly gage, but there is a greater degree of scatter in the measurements at Kansas City. The USGS 2015 stage discharge rating curve for the Kansas City gage (Figure 2) is actually plotted above almost all the measured data points, which is indicative of bed aggradation at the gage location. The temporal characteristics and trends in this data scatter are best analyzed by specific gage analysis and discussed in the following section.

Specific Gage Analysis

A specific gage plot shows the stage for a given flowrate over time and temporal trends in the rating curve can then be identified. We focused our analysis on the lower flow measurements as low flows are of key concern in the Missouri River degradation study. The Construction Reference Plane (CRP) flow was chosen for analysis since this is a key design flow for planning purposes of the Missouri River bank stabilization program. We extracted and used all measured flows within +/- 500 cfs of the CRP flow for each gage. The CRP flow is reported by the USACE as 45,100 cfs and 44,200 cfs at Waverly and Kansas City gages, respectively. These specific gage plots are shown in Figures 3 and 4 for the Waverly and Kansas City gages, respectively.

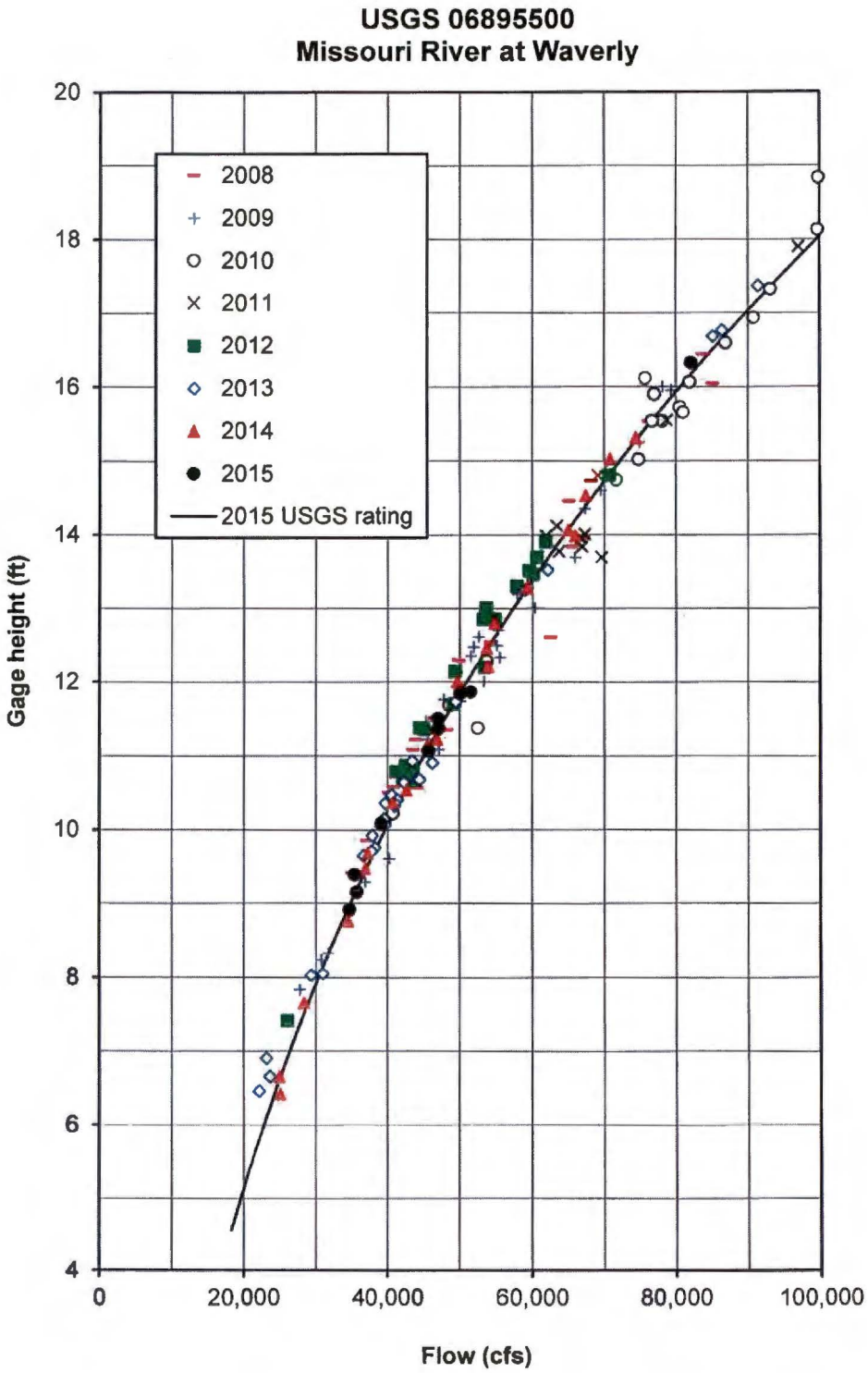
For the CRP flow the specific gage plots (and the dotted trend lines) show a clear trend of increasing stage over time, which is consistent with bed aggradation within this reach. The time period includes the high flow year of 2011. For the Kansas City gage (Figure 4), the specific gage analysis and data indicates that most all of the measured stage values for CRP flows after the 2011 high water event (all data points after 10/1/2011) are actually higher than the measured stage values prior to the high water event. These higher CRP flow stages are an indication of deposition in the Kansas City region.

Bed Survey Analysis by the USACE

The USACE presented measured bed aggradation values for the 2009 through 2013 time period at the February and July dredge permit meeting and their data generally indicates bed aggradation over the same reach that Holliday Sand and Gravel had sand dredging operations during this time period.

Conclusions

The results of our analysis of the USGS gage data and the USACE independent bed survey results indicate that the Missouri River is generally aggrading near the Kansas City and Waverly USGS gages and the sand dredging proposed by Holliday is a sustainable quantity in this reach of the Missouri River. Bed aggradation has occurred in this reach over a wide range of hydrologic flow conditions in recent years, and the resultant bed aggradation has resulted in an increase in low flow CRP stage in this portion of the Missouri River.



e continued bed

Figure 1. Measured stage and discharge data for the Waverly gage

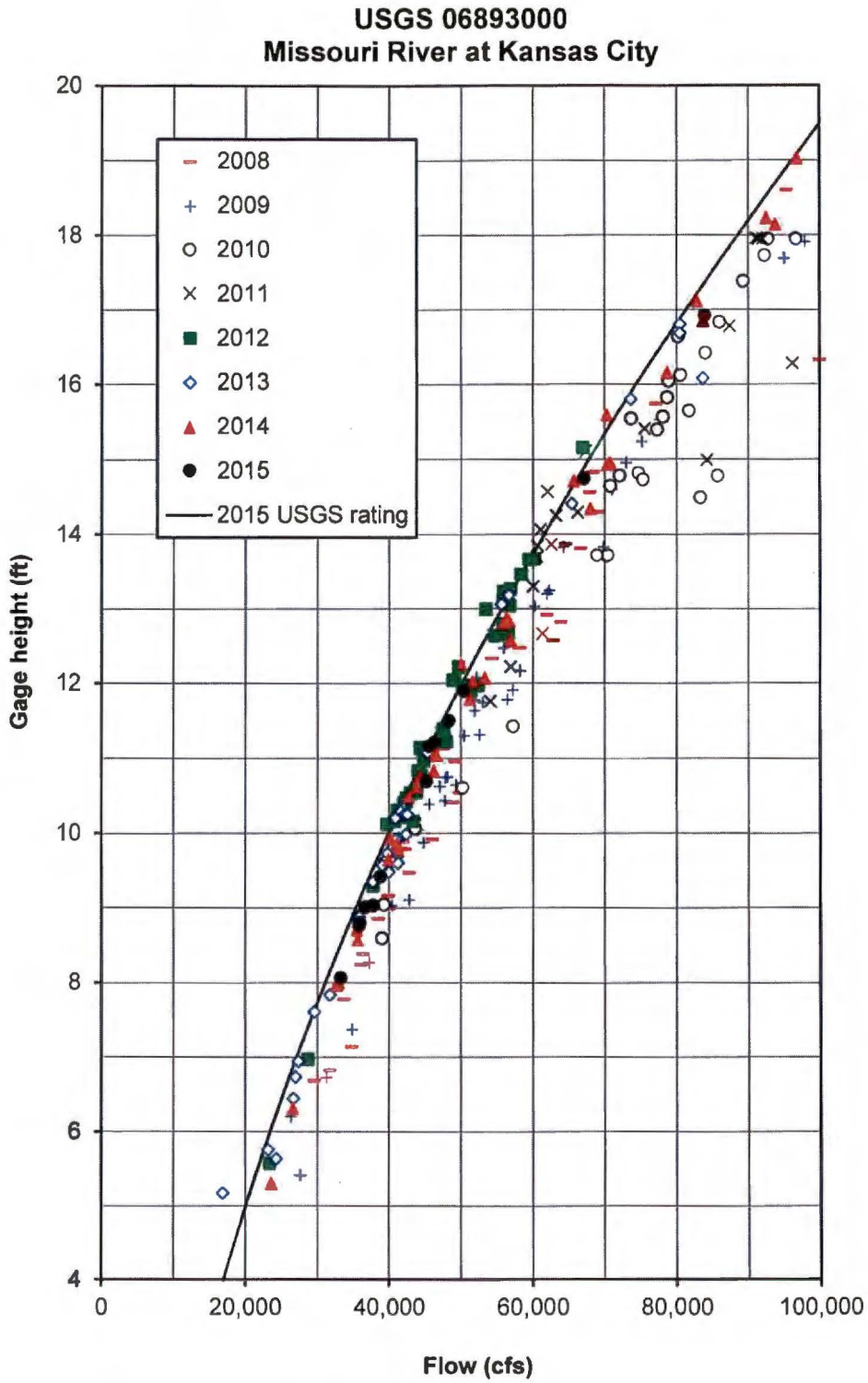


Figure 2. Measured stage and discharge data for the Kansas City gage

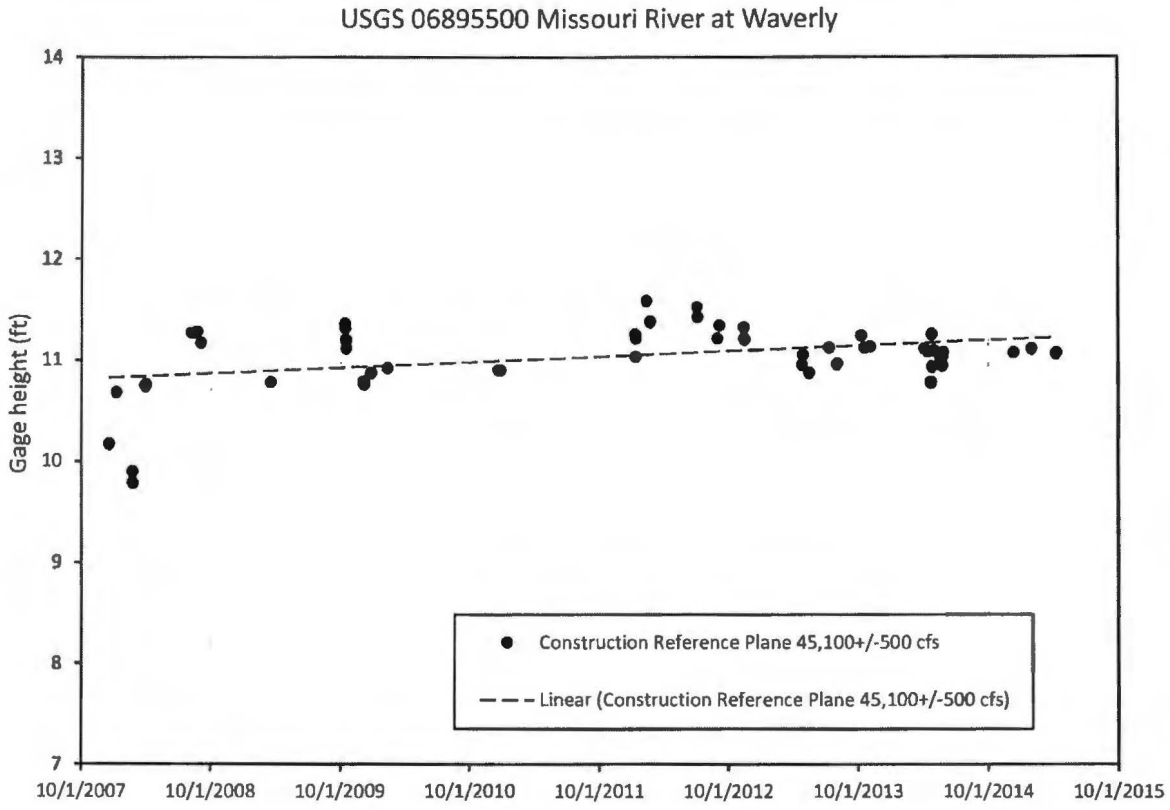


Figure 3. Specific gage plot for CRP flow at Waverly gage

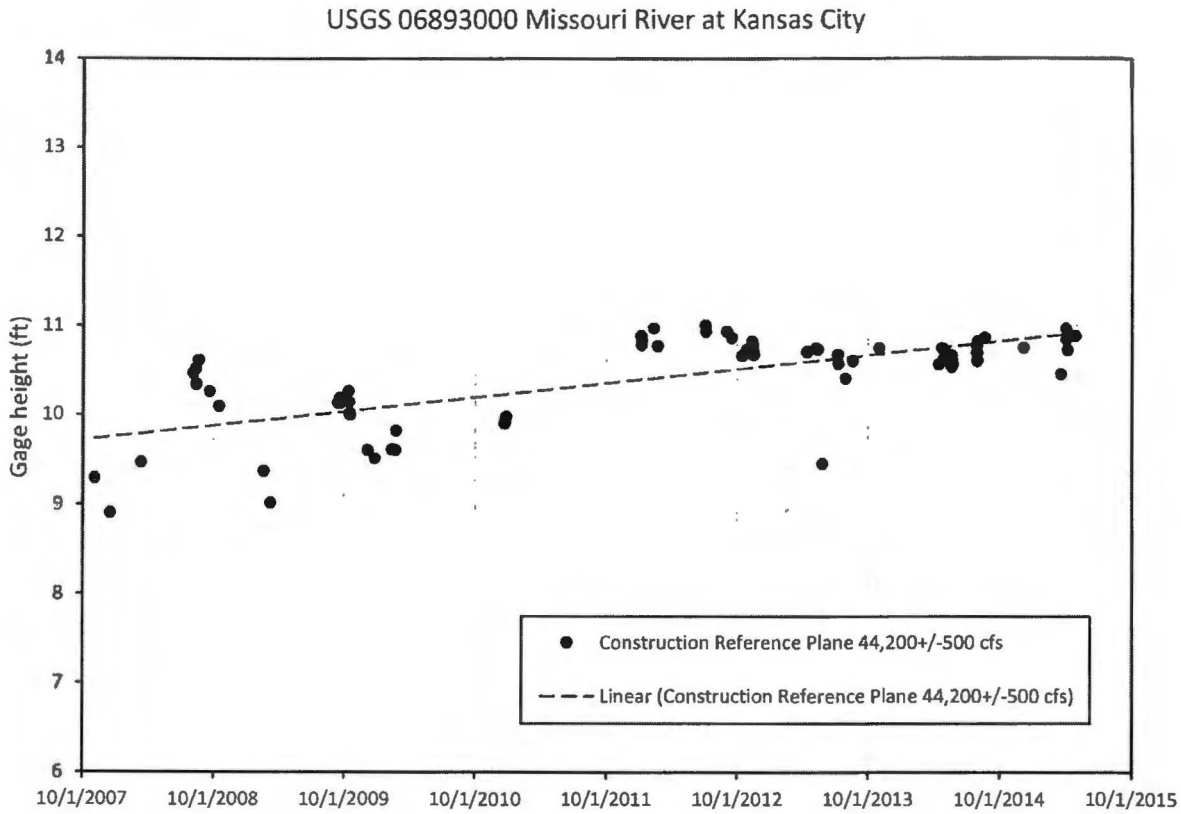


Figure 4. Specific gage plot for CRP flow at Kansas City gage

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September 18, 2015

Via Email

Matthew Sailor, Regulatory Project Manager
David R. Hibbs, Assistant Chief, Regulatory Branch
U.S. Army Corps of Engineers
Kansas City Regulatory Office
601 East 12th Street, Room 402
Kansas City, MO 64106

RE: WaterOne Comments in Response to Public Notice of Missouri River Commercial Dredging Permit Renewal Request

Gentlemen:

We sincerely appreciate all comments that were submitted regarding the renewal of the Missouri River dredge permits. The comment from WaterOne is helpful to this process as it points to areas of concern that need to be elaborated on. We value this opportunity to better communicate those issues from our perspective and believe our response addresses the concerns of WaterOne and possibly others that did not submit a written comment.

WaterOne (W1) comment (paraphrased) and Holliday's (HSG) response following:

1. **W1 Comment**: WaterOne is requesting a formal public hearing for maximum input.

   HSG Response: Holliday defers to the Corps regarding the form of any needed further public input, but also is willing to provide further explanation to W1 and the public regarding changes in dredge permit requirements and data collection that have already occurredand have resulted in sustainable dredging levels. For example:

   a. Reference is made to the 3 year, $3MM Dredging EIS that was performed four years ago for the previous renewal of dredge permits on the Missouri River. With

this study, the Corps determined what is certainly a safe and sustainable amount of dredging in KC as well as the lower 500 miles.

b. This study resulted in dramatic reductions and changes to dredging in KC (79% reduction), an amount which is only 10% of the actual average sand bed load moving through KC.
c. Among the permit requirements were river surveys to monitor dredge impacts, recording belt scales and GPS that verify and record dredge locations and output, and dredge reach limits.
d. Finally, the USACE river cross section surveys completed since 2009 have shown sediment deposition in reaches where dredging has occurred in this same time period, indicating that dredging in recent years has been accomplished in a sustainable manner in accordance with the sediment delivery from the Missouri River. This serves to confirm the sustainability of dredging levels determined in the Commercial Dredging EIS, especially after the extreme flood/flow event of 2011.

2. **W1 Comment:** "We believe that dredging permits on the Missouri River should not be renewed at this time and should remain inactive at a minimum until the Degradation Feasibility Study is complete."

   HSG Response: Holliday believes this would be an unnecessary and extremely costly measure. Missouri River data gathered since 2009 has demonstrated that dredging at the new reduced levels and locations show bed aggradation (the elevation of the river bed is coming up) and sediment deposition in reaches where dredging is occurring, indicating that river dredging in recent years has been accomplished in a sustainable manner in accordance with the natural sediment delivery from the Missouri River.

   The extreme reservoir discharge of 2011 was an anomaly that increased degradation upstream of KC in the St Joseph segment (above river mile 390). However, river surveys completed in 2013 and 2014 confirm significant (approximately two-thirds) recovery above mile 390 and aggradation downstream through Kansas City, from mile 390 down to mile 330, where again dredging has been occurring over the past five years at evidently sustainable levels.

   Suspending Holliday's dredge permit would effectively shut down construction throughout KC. This would eliminate the key reliable and quality source of concrete sand that is desperately needed for all concrete construction (highways, homes, hospitals, retail and commercial). There is no surplus of sand available to KC. All existing

sources are working hard to keep up with the current demand.No justification has been presented for any additional reduction in dredging let alone cessation.

To the contrary, the Degradation Study's economic model is likely to determine that the worst possible degradation impact in KC would be the loss of river dredging, resulting in ongoing increased annual costs of $13 million (over $600 million over 50 years, from added cost of production and trucking from new off-river pit locations). In addition, the mobilization of these new sources would be delayed several years due to planning and permitting requirements, leaving KC with no local concrete sand alternatives for these years.

3. **W1 Comment**: Drought conditions in 2004 rendered WaterOne's Missouri River surface intake useless because of the combination of degradation, record low releases and cold temperatures.

   HSG Response: Yes, 2004 was a perfect storm of events that were not anticipated and resulted in extreme low water levels for water surface intakes. The following are the conditions that all came together that year, which are highly unlikely to reoccur:

   a. A record Missouri River system drought from 1999 to 2007 resulted in low river stages and a cycle of sediment buildup behind dikes and extended periods of low water scouring in the navigation channel.
   b. The USACE did not anticipate the impact of extreme water conservation measures during extreme cold, resulting in ice dams and drops in water surface levels (USACE now increases flows during icing conditions to prevent this).
   c. The USACE did not properly maintain the River dikes at the prescribed height according to the BSNP Operating Plan for an extended period of time, resulting in increase River velocity and additional scouring over a long period of time.
   d. Bed degradation increased following the 1993 500-year flood event.

4. **W1 Comment**: Preliminary results from the Degradation Study Mobile Bed Model (MBM) demonstrate that dredging is a significant contributor to degradation.

   HSG Response: Holliday has also been a key participant and financial supporter of the degradation study since its inception. Being an active stakeholder in the degradation study, we take exception to many of the preliminary results and findings presented by the Corps' study team that are based on the ongoing Mobile Bed Modeling (MBM).For that reason we agree with the Corps' regulatory decision that further reductions in dredging based solely on the existing Model are not appropriate at this time.

Holliday has engaged recognized experts in sedimentation engineering and river geomorphology to provide an independent review of measured river cross sectional surveys, sediment discharge measurements completed by the US Geological Survey, and MBM assumptions, setup, calibration, and application. They have identified several key issues[1] that cast serious doubt on the validity of the model setup, calibration, and application on information presented to date by the USACE, and have submitted recommendations that will improve the validity of the Model. The USACE has acknowledged comments made by our experts as valid and are in the process of updating the MBM accordingly.

Note that this study has not gone through the full USACE review process and still has to go through an Independent External Panel Review (IEPR) process comprised of national and regional experts that have no vested interest in the outcome.

5. **W1 Comment**: A schedule waiver is needed to continue the Degradation Study because of comments submitted by commercial dredgers regarding the MBM.

   HSG Response: Holliday's comments have indeed added to the length of the study. However it is our understanding that all other stakeholders agreed that this time was needed to address the concerns cited above in Response #4. The necessary complexity of the Model was never anticipated, but ultimately it is in all stakeholders' interests to ensure it's robust and accurate.

   Other causes of delays that have resulted in the need for an extension.[2]

   - USACE internal Model review which in itself added 6 months to the study.
   - Addition of a targeted IEPR for the Mobile Bed and Economic models.
   - 2011 record reservoir releases that generated additional Model input and added to the calibration process time.
   - 2013 Flood Recovery Survey that generated additional Model input.
   - The preparation for an EIS that was not originally planned.

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[1]The MBM does not compute sediment fluxes in accordance with sediment discharge measured by the USGS in Kansas City, ignores any sediment erosion or deposition between dikes, and computes bed material sediment armoring processes that are not valid on a dune covered river such as the Missouri River. Their analysis also fails to explain why significant degradation has occurred in reaches of the river far outside of any limits or regions where dredging occurs, thus ignoring the effects of river training dikes on the long term degradation in the region. Finally, we also question the quality assurance and quality control review process for the MBM model development to date, as the review and checking documentation does not appear to be in accordance with standard USACE review procedures.

[2]Per Christina Ostrander, USACE, Degradation Study Project Manager

- Delaying the "Without Project" alternative determination pending Dredging 404 permits.

6. **W1 Comment**: Sand and gravel needs of the Kansas City area can be met by off river mining.

   HSG Response: Some off-river pit mining sites have been developed since the tonnage reductions in Missouri River dredging permits, but have failed to become reliable alternate suppliers of concrete sand. Their production has primarily been byproducts: asphalt and fill sands, and gravel, which comprise less than 20% of the sand market.

   For example, Holliday once operated a relatively large Missouri River flood plain pit, and like its previous two operators, could not profitably supply concrete sand due to the difficulties of the deposit resulting in excessive waste product. For years now a fourth operator has been on that pit site, invested tens of millions of dollars and has not been able to consistently provide quality concrete sand. Another pit nearby has also made a huge investment but has struggled due to the surplus of fine sandthey must excavate in the flood plain. If Holliday cannot dredge concrete sand from the Missouri River, there would be severe shortages, major project delays, and eventually huge construction cost increases in the KC metro.

7. **W1 Comment**: Dredgers enjoy a no cost place of operation at the expense of public infrastructure.

   HSG Response: This is incorrect. Holliday pays a significant royalty ($0.15 per ton) to the state of Kansas on approximately half of what we dredge in the Missouri River. It is actually land-based pit mining that pays almost no royalty. In addition, Holliday pays a $0.20 per gallon Waterways Fuel Tax used for federal maintenance of inland waterways.River bed surveying and monitoring costs required to meet the conditions of our USACE dredge permit average about $100,000 each year.

8. **W1 Comment**: Renewing dredge permits will result in public cost to repair and maintain infrastructure and threaten total failure of that infrastructure.
   HSG Response: The Degradation Study to date has determined that no federal levees, floodwalls or revetment are threatened from the continuation of degradation at its current rate, with or without river dredging. When dredging, at its current permitted level, Holliday only removes 10% or less of the mobile sand bed that flows through KC. Further, eliminating dredging is not the solution to bed degradation that has been occurring since the 1930's.

We repeat, recent river cross section surveys completed since 2009 have shown sediment deposition in reaches where dredging has occurred in this same time period, indicating that bed material dredging in recent years has been accomplished in a sustainable manner in accordance with the sediment delivery from the Missouri River, as contemplated by the EIS.

Holliday is committed to assuring that Missouri River commercial sand dredging, necessary for building and maintaining our entire infrastructure, is accomplished in a sustainable manner with minimal to no environmental impact and in accordance with the natural delivery of bed material sediment that the Missouri River provides.

Sincerely yours,

Holliday Sand & Gravel Company

Michael R. Odell

Mike Odell

Vice President - Operations

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September 18, 2015

VIA EMAIL

Matthew Sailor, Regulatory Project Manager
David R. Hibbs, Assistant Chief, Regulatory Branch
U.S. Army Corps of Engineers
Kansas City Regulatory Office
601 East 12th Street, Room 402
Kansas City, MO 64106

RE: MoDOT Comment in Response to Public Notice of Missouri River Commercial Dredging Permit Renewal Request

Gentlemen:

The Missouri Department of Transportation has requested 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.

Holliday Response

Currently, dredging is not allowed within 500 feet upstream or downstream of bridges.

It is common engineering knowledge that all piers subjected to river current scour in a very localized area, primarily on the upstream face of the pier. So the issue is not whether scouring exists, but whether dredging can exacerbate pier scour and if so, is there a difference in impact if dredging is upstream or downstream of the pier an additional 500 feet. Another factor that has not been differentiated is the actual distance side to side from a bridge pier, as currently, the 500 foot no dredge zone is across the entire channel width, again regardless of the actual location of the piers.

Holliday is committed to assuring that Missouri River commercial sand dredging, necessary for building and maintaining our entire infrastructure, is accomplished in a sustainable manner with minimal to no environmental impact and in accordance with the natural delivery of bed material sediment that the Missouri River provides.

Holliday has previously presented comments documenting river dredging's significant economic benefit to the general public through the availability of quality material as close as possible to the point of use, as sand is very dense and is costly to transport by truck. One of the ways this expense is mitigated is by having river terminals to unload river dredged sand near to the main arterial highway system, which Holliday does. With that in mind, if is also important to consider the barge towing distance from the dredge to the river terminal which contributes to the cost of the sand. Therefore, increasing the bridge no-dredge zone by 1000 feet to 2000 feet effectively adds 1000 feet of towing distance each way from the river deposit back to our terminal, assuming that we would be dredging within that 500 foot area added to the existing 500 feet above and below the bridges. We estimate that added cost is approximately $0.026 per ton. Applying that to an annual volume of 1.5MM tons would cost Holliday more than $40,000. per year.

As the potential cost of increasing the bridge no-dredge zone by 1000 feet could be significant, it is worthwhile to evaluate whether the change and its added cost actually reduces pier scour and if such reductions add any increased stability to the bridge.

At this time we do not have data regarding the potential for bridge pier scour. Like Holliday, MoDOT is one of the stakeholders participating in the Missouri River Degradation Feasibility Study. As such we are both aware that studies have been done regarding degradation impacts to bridge piers in conjunction with the Study, but results have not been published.

In the meantime, we must all monitor the riverbed as it affects us, as bed degradation has been ongoing since the 1930s navigation modifications to the River. And while we wait for the Degradation Study to be completed, we will continue to comply with the USACE's authorized dredging locations which we understand can be modified at any time there is a valid concern.

So at this time, Holliday requests that the no-dredge zone of 500 feet upstream and downstream of bridges and pipelines remains as such until we have a report or data that would justify a blanket change and the additional economic cost to the public. Along with the other Dredger applicants, we would be glad to meet with MoDOT in the mean time to discuss the reason for their concerns and how we might alleviate those concerns.

Sincerely yours,
Holliday Sand & Gravel Company

Michael R. Odell

Mike Odell
Vice President - Operations