

CENWK-ED-HR

24 Jun 09

MEMORANDUM FOR OD-R

SUBJECT: Recommended Commercial Sand Dredging Quantity Limit For 2010 in Kansas City Reach

1. The Kansas City reach of the Missouri River (river mile 320 to 400) is degrading. The degradation is adversely affecting infrastructure such as water intakes, revetments, and pipelines. Multiple engineering studies to date have shown a strong correlation between dredging and degradation. This memorandum addresses the risk of continuing dredging in the Kansas City reach after December 2009.
2. The completion of a Missouri River commercial dredging EIS prior to issuing new permits is required by the current commercial dredging permits. This requirement is based on ongoing degradation in the riverbed and the resulting impacts. Within the Kansas City District, the Kansas City reach of the river has experienced the greatest amount of degradation and hence the greatest negative impacts. The Commercial Dredging EIS, when complete, will provide the necessary information to establish appropriate limits for dredging activities along the entire river.
3. As defined in the Department of the Army Permit Evaluation and Decision Document signed 20 August 2007 by Roger A Wilson, Jr. Colonel, Corps of Engineers District Commander, the permits specify that no more than 2.5 million tons of material can be removed from the river between RM 328.00 and RM 382.70 in calendar year 2009. The permits and the quantity limits expire at the end of 2009.
4. Ongoing studies subsequent to enactment of the current permits continue to provide strong evidence that dredging contributes to degradation and that the degradation is continuing. In the Kansas City reach this is especially troublesome due to the close proximity of important infrastructure next to the river. It is essential that degradation in the Kansas City reach be held to a minimum in order to slow the evolution of damages in the reach. Recent bank failures at river mile 380, where degradation is the most advanced, bring to focus the potential dangers to infrastructure. Levees and floodwalls adjacent to the river channel throughout the reach are susceptible to significant damage if similar bank failures are initiated by degradation. A bank failure occurring during a flood event could be catastrophic. The Kansas City District Levee Safety Committee has been briefed on these conditions and concurred that there is a potential for adverse impacts to federal levees conditions.
5. Should an EIS not be completed by the end of 2009, Engineering Division supports the cessation of dredging in the Kansas City reach as specified in the current permits. The anticipated completion date for the EIS is June 2010. However, given the pace of activity on the EIS, it appears unlikely that the EIS will actually be complete by the end of calendar year 2010.

CENWK-ED-HR

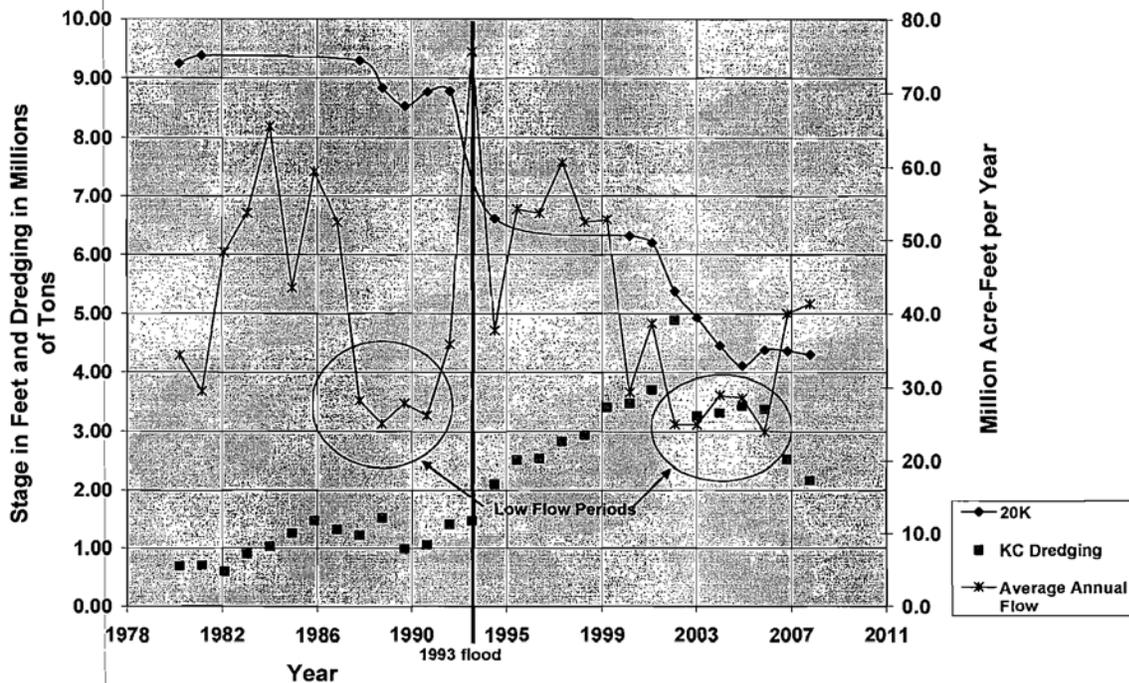
SUBJECT: Recommended Commercial Sand Dredging Quantity Limit For 2010 in Kansas City Reach

6. Given the current knowledge of the impacts of degradation and the propensity of dredging to exacerbate degradation, it is concluded that dredging beyond 31 December 2009 at current levels, even for one year, represents a potentially unacceptable risk to critical infrastructure. If OD-R chooses to renew the permits at the end of 2009 without a completed EIS, it is essential that further quantity restrictions be enacted within the Kansas City reach. The following is the rationale behind ED's recommended quantity limit for the Kansas City reach for 2010.

a. The formulation of the current restrictions was initiated by an Ad-Hoc panel in November 2003 whose members had expertise in sediment transport, hydraulics, and fluvial geomorphology. The panel recommended that quantities in the Kansas City reach be limited to 2.5 million tons per year when annual flows are at or below 27 million acre-feet (MAF). This recommendation was subsequently uncoupled from average annual flow due to the extended drought and accelerating bed degradation.

b. More detailed evaluations of river flows, dredging extraction, and bed degradation have shown the potential impact of dredging on degradation to be greater than elucidated by the panel. Figure 1 shows river stage for 20,000 cubic feet per second (cfs), annual flow at the Kansas City USGS gage, and dredging extraction quantities for the years 1980 to 2008. The data indicate that in years of less than approximately 30 MAF of average annual flow at Kansas City, an annual dredging quantity of approximately 1.4 million tons may be sustainable while an annual dredging quantity of 3.7 million tons is not sustainable. Additionally, during high flow periods of greater than 50 MAF, an annual dredging quantity of less than 3.0 million tons may be sustainable. The three most recent flow years have had an average annual flow volume of approximately 34 MAF. By prorating between the potentially sustainable values of 1.4 and 3.0 million tons a value less than 1.7 million tons is obtained. However, the average annual take during this period was 2.7 million tons. Based on these computations, no more than 1.7 million tons of dredging should be permitted during 2010.

Figure 1. Stage at 366.1 for 20 kcfs (KC USGS Gage)



c. Studies completed in 1999 (Final Report Missouri Levee Unit L385 Sediment Analysis, May1999) and 2000 (Final Report Missouri River Levee Unit L-385 Dredging Impact Study, April 2000), in support of dredging for construction of L-385 levee, provide information regarding predictions of long term sustainable dredging levels. (These studies were not presented to the Ad-Hoc panel.) Estimates of bed sediment transport at the Kansas City USGS gage location were made using suspended sediment measurements, flow records and the Modified Einstein Method. The 1999 report states on page 58, “Over the period of record, the average annual bed load amount has been equal to 1.3 million tons/year. Dredging in excess of the bed load amount would be expected to cause impacts to the channel and potentially surrounding infrastructure.” This statement was in reference to dredging upstream of the mouth of the Kansas River and it was assumed that the Kansas River contributed approximately 20 percent of the flow and bed load at the Kansas City gage. Neither the 1999 or 2000 studies considered the added impacts of dredging in the Kansas City reach downstream of the USGS gage. Although these computations are valuable in the general understanding of the bed material transport of a stream, there is often an order of magnitude of scatter associated with such computations (pp. 221-222, ASCE No.54 Sedimentation Engineering, 1975). The following

CENWK-ED-HR

SUBJECT: Recommended Commercial Sand Dredging Quantity Limit For 2010 in Kansas City Reach

figure from page of 15 of the 1999 report attests to the scatter of the data used to draw conclusions.

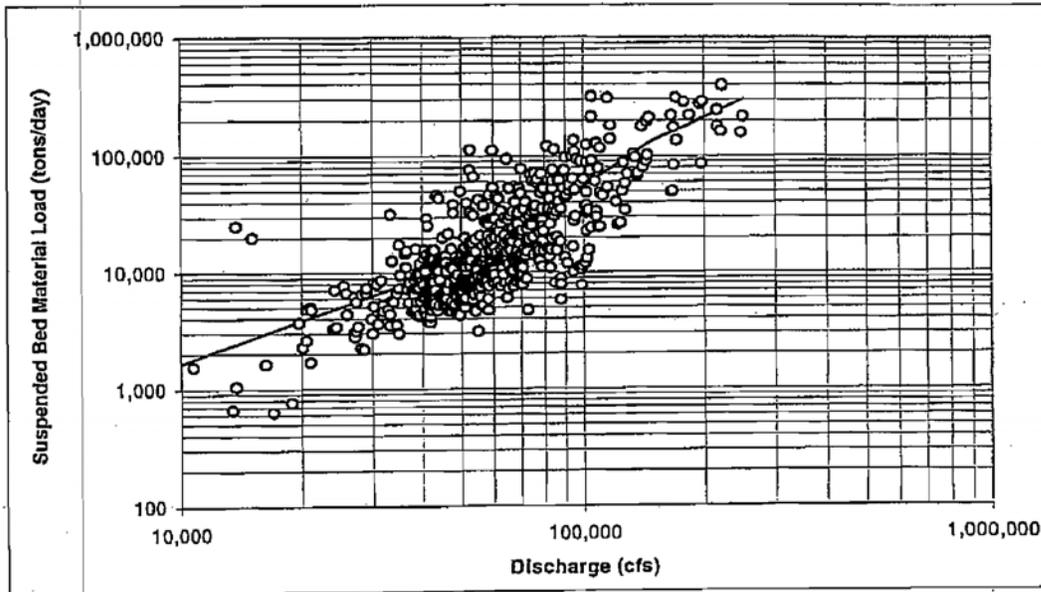


Figure 4-7: Suspended bed material load at the Kansas City Gage.

Thus, the 1999 report's estimate of 1.3 million tons of average annual bed load should be viewed as an approximation and should be evaluated against observation of the river bed over time. However, at this time it does serve as our best computed estimate of average annual bed load which is directly related to sustainable dredging levels.

d. Analysis of water surface profiles (WSP) collected annually since 2005 through the KC reach indicate that the river bed is continuing to degrade (figure 3). Three WSP were adjusted to Construction Reference Plane (CRP) flows and then compared to the 2005 CRP water surface profile. The three profiles show a progressive downward trend since 2005 with the most significant downward trend between river miles 360 and 410. The river between river miles 360 to 386 is the most actively dredged area within the Kansas City reach.

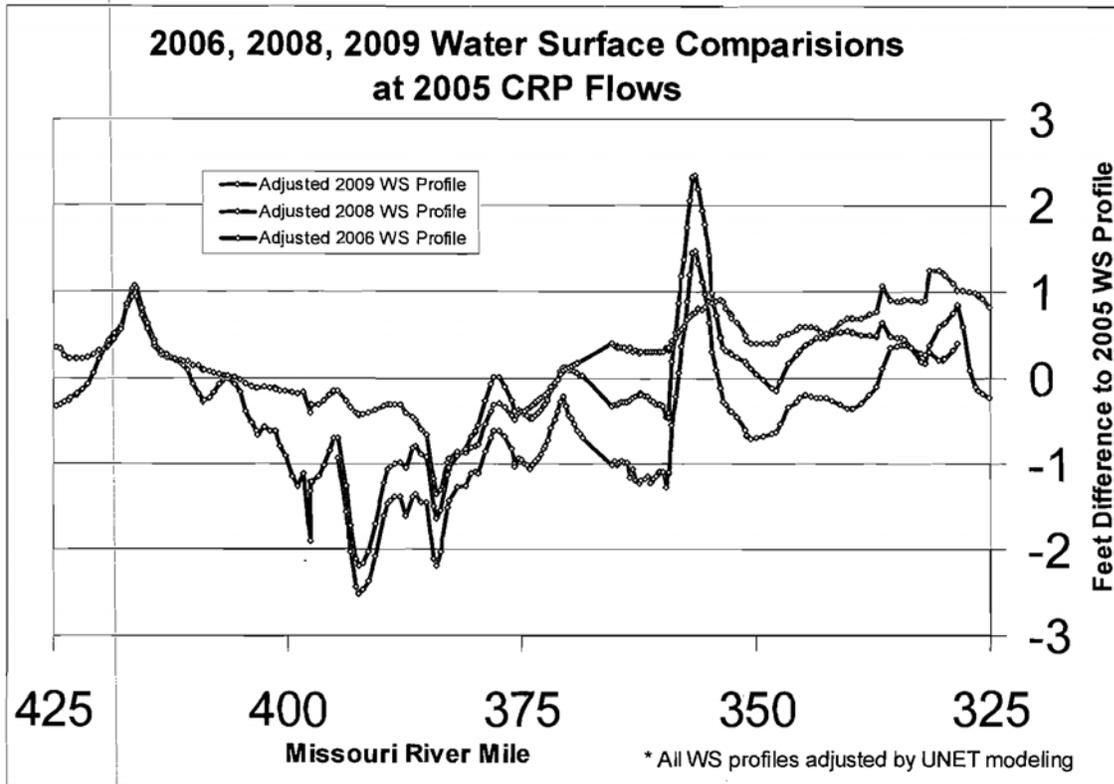


Figure 3.

Figure 3 shows that the causal factors of degradation have not been abated and risk to infrastructure in and along the river is more significant now than at anytime in the past. This fact is manifested in the failure of the revetment at river mile 380.

Continued dredging of the river is likely a significant factor in the downward trend of the water surface shown in figure 3. Continued removal of material will likely result in further degradation of the bed due to removal of the material itself and/or disruption of the natural stratification of sediment particle sizes in the thalweg (defined for this memo as the portion of the river between the ends of the dikes and the opposite bank).

7. Conclusions and Recommendations: If the dredging permits are renewed after December 2009 without a completed EIS, current data indicates that dredging quantities should be reduced from current levels within the KC reach. Given the totality of the analysis presented above, the revetment failure which occurred at river mile 380, and the critical infrastructure such as levees reliant on those revetments, ED recommends that dredging quantities in the KC reach for 2010

CENWK-ED-HR

SUBJECT: Recommended Commercial Sand Dredging Quantity Limit For 2010 in Kansas City Reach

be limited to the computed bed load of 1.3 million tons. Further, to prevent disruption to the natural stratification of the sediment particles in the thalweg and to increase the likelihood of bed load capture, this quantity should not be removed from the thalweg portion of the river. For 2010, the material should be removed from the inside bends of the river and within the dike fields. If this recommendation is adopted, ED-HR staff will work with OD-R staff to further define the limits of these areas.



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Holliday

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September 10, 2009

Mr. Cody Wheeler
Regulatory Project Manager
Regulatory Branch
Kansas City District Corps of Engineers

Re: 2010 Missouri River Dredge Permit

Dear Cody:

We are very grateful to be given the opportunity to provide input concerning the proposed special conditions for our interim dredge permit extension (while the EIS is being completed).

Unfortunately, the proposed restrictions we discussed on the 14th at your offices were leaked and we are trying to deal with panicked customers that are already worried about sand shortages. Our customers are keenly aware that no alternative exists for quality concrete sand north of the Missouri River.

Below we respond to the two dramatic changes proposed for the 2010 dredge permit extension: reduction of the Kansas City reach quota from 2.5 MM tons to 1.3 MM tons, and restricting dredging in the KC reach to only those area that are behind the dikes on the inside bends.

Projected needs for 2010:

Our sales from the two Kansas City reach plants, Randolph and Riverside, is at 1.1MM tons through August and is trending toward 1.6MM for 2009. We see some Stimulus projects starting up in 2010, but of more concern is the availability of sand on the Kansas side of Kansas City. Two sand pits and one river operation on the Kansas side could deplete in 2010. Although we have a new site in Shawnee, all permits are not in place, we have not broke ground, and we anticipate a slow startup in late 2010 as we begin pumping in a small body of water. The Riverside Plant on the Missouri River was built to make up for the Kansas River reductions in 1990 and continues to augment Kansas markets. We assumed that the Riverside Plant had the ability to pick up the slack when all three of these Kansas dredge sites deplete sometime in 2010, until the new pit in

Shawnee gets up to speed. For those reasons we request 1.8 MM tons in the Kansas City reach of the Missouri River.

We don't currently have equipment or reserves for alternative methods of dredging in 2010. We will need at least another year to attempt to permit out-of-stream dredging such as in the Nearman Bottoms. We don't have enough large barges to tow outside the KC reach. It would take two years to build and take delivery. The size and design of the barges we use are not readily available. Our current towing distance is limited to 12 miles loaded downstream. To dredge outside the KC reach that has been set downstream at River Mile 328 would entail towing loads 32 miles upstream. That is not currently feasible with our equipment.

At this time, alternatives to in-stream dredging that we have pursued are bogged down with concerns over impacts to collector wells. It will take one year just to study those impacts and redesign for mitigation if possible. Closing on property is scheduled for 2012 and if everything ends up going our way we are looking at a 2013 startup at Nearman. One competitor's pit on the east edge of town is not producing a marketable product because of the excessive fines in the deposit that were a problem for us years ago when we operated a nearby pit. Another proposed pit in that area may not be feasible as they may impact Liberty municipal water quality. Pits proposed on the north side of town are a concern to adjacent property owners that fear short circuiting of federal levees. Other flood plain property we have pursued is not for sale at any price. These proposed remote Missouri sites are a moot issue as they don't provide a feasible alternative for the Kansas side and certainly won't pick up the slack in 2010.

Channel location restrictions:

Prohibiting dredging in the channel is not practical as we can only dredge out of the channel behind the dikes in periods of extended high flows. We need adequate water depth to float the dredge to set the anchors beyond the actual point of excavation (the dredge moves by pulling on the anchor lines). The other even greater issue is the amount of wasted fine sand that must be discharged back in the River near the dredge. Without adequate water depth and current to disperse it, discarded finer sand quickly accumulates causing the dredge, barges and towboat to be grounded (stuck). Dredging out the channel (behind the dikes) can only be done during periods of high water (KC stages over 18 feet). This is not anything we can depend on and should not be mandated in lieu of in-channel dredging.

When we were recently asked about the possibility of dredging behind the dikes, we thought that the Corps was offering additional dredging areas that we don't already have (such as closer to the dikes and to the accreted shoreline) in order for us to excavate those areas to reduce buildup and channel narrowing. Unfortunately, almost all of the adjacent areas behind the dikes have already been dredged over the years and don't fill back in with coarse enough sand to make concrete sand. If this alternative doesn't include previously restricted areas behind the dikes, a plan to make it mandatory, so as to eliminate channel dredging, would put us out of the concrete sand business.

We request that dredging behind the dikes to be similar to dredging outside the KC reach so as to have another option to meet demand should it exceed the quota in the reach. Sand

“stored” behind the dikes that could feasibly be dredged during high flows should be considered a bonus for emergencies, not considered as a substitute for in-channel dredging.

Dredging the Inside of the Bends:

Areas of detected levee toe degradation, such as the airport and NKC levee could be considered for no-dredge zones. However, we oppose carte blanche restrictions on the outside of all the KC bends pending a joint meeting to study the actual cross section to determine a more precise setback distance on a case by case basis. We are not sure how far we need to be from the river bank on the outside bends to be able to make concrete sand. Since we are currently kept back 200 feet from a reveted bank, increasing the setback distance from the outside bank may be unnecessary and could diminish the benefits of widening the channel from dredging from the inside of the bend. In other words we aren't sure where that point is when the outside of the bend becomes the inside of the bend. We really need to study the cross sections on each bend.

We hope this explains what is feasible to get us through 2010. We are requesting a 28% reduction in the Kansas City reach (from 2.5MM to 1.8MM tons) for 2010. Thank you so much for requesting our input.

Sincerely,

Holliday Sand & Gravel Company

Mike Odell
Vice President, Production