US Army Corps
of Engineers
Kansas City District

Lower Missouri River Sediment Model
MRRP Alternatives

Aug 2018

1. Introduction

The purpose of this appendix is to document the 2033 projected future bed elevations produced for the Missouri River Recovery Program. The model creation and calibration process are described in the *Lower Missouri River Sediment Model Calibration Report*, referenced herein as the *Model Calibration Appendix*. This appendix describes updates to model geometry, explains the development of the hydrologic boundary condition for the projection period and provides bed elevation results testing six MRRP alternatives.

This analysis produces an adjustment factor to apply to the MRRP Unsteady RAS model, described in the Unsteady HEC-RAS Report, to update the bed from 2009 to 2033 conditions. This is accomplished by dividing the results at the end of 82 years of sedimentation modeling by 82 to create an average annual bed change. The average annual change is multiplied by 24 to compute the average offset from 2009 to 2033. The actual bed elevations in year 2033 will depend on the flows and dredging levels that actually occur between 2014 and 2033, whereas the analysis presented in this appendix represents an average condition.

2. Geometry Updates

The model was built with 1994 bathymetric data and calibrated to water surface, velocity, and bed change from 1994 to July 2014 as described in the *Model Calibration Appendix*. Following model calibration, model bathymetric data was updated to a summer 2014 hydrographic survey. Incorporating the recent survey information provides a more accurate starting geometry than starting with the end-of-simulation geometry from the calibration model. The 2014 bathymetric survey included measured bed transects at 500 ft spacing. The nearest 2014 bathymetric transect was used to update the model bathymetry. Transects were merged into the HEC-RAS cross-sections using geo-referenced stationing. The structure heights were maintained at the same elevations as described in the Model Calibration Appendix.

3. Alternatives

Table 1 summarizes the six MRRP alternatives (from the Unsteady RAS Alternatives Analysis Report). As seen, the six alternatives include one of three different geometries paired with one of six different projection flow scenarios.

Table 1. Alternatives (Table 1-1 from Appendix E)

Alternative	River Geometry (RAS)	Reservoir Flow (Res-Sim)	Adopted Alternative Short Name
Alternative 1	No Action	No Action	No Action
Alternative 2	BiOp	BiOp	BiOp
Alternative 3	IRC	All Mechanical	Mech
Alternative 4		Spring Bird Flow 2, 42 MAF	Spring 2
Alternative 5		Fall Bird Flow 5, 35kcfs service level	Fall 5
Alternative 6 *		Pallid Spawning Cue	Spawn Cue

* Former name was Alternative 7, which may corresponds to some HEC-RAS model runs and file names

4. Geometries

4.1 Overview

The following paragraphs explain the three geometries:

1. **No Action**
   Assumes habitat construction activities follow current practices to achieve 20 acres/mile of SWH, the minimum target specified within the 2003 Amendments to the 2000 Biological Opinion (2003 BiOp) of 20-30 ac/mi (USFWS, Dec 2003). Habitat distributed by 2003 BiOp reaches and the 2014 *Shallow Water Habitat Accounting Report* (USACE, Sept 2014) was used to determine the acreage deficit within each reach to attain the 20 ac/mi goal. Habitat was placed to provide 0 – 5 ft of depth at August 50% exceedance flows. Most of the SWH added to the geometry was in the form of top width widening, the remainder accomplished with chutes.

2. **BiOp As Written/ As Projected (BiOp)**
   Guidance from the US Fish & Wildlife (USFW) documented in *Planning Aid Letter Regarding the Missouri River Recovery Management Plan-EIS: USFWS 2003 BiOp*

Projected Alternative was provided to create a geometry which represents an ideal implementation of the 2003 BiOp. It assumes habitat construction accomplishes 30 ac/mi of SWH, and performs at a wider range of flows. Similar to the No Action geometry, habitat was distributed by 2003 BiOp reaches, and the 2014 *Shallow Water Habitat Accounting Report* was used to determine the acreage deficit within each reach to attain the 30 ac/mi goal. One third of the habitat was set to provide shallow water at summer low flows, one third at median August, and one third at a spring pulse flows. Most of the SWH added to the geometry was in the form of top width widening, the remainder accomplished with chutes. Part of the BiOp requirement was maximizing floodplain connectivity, and a separate analysis was conducted as documented in Section 2.8 to ensure the requirements were met, although no changes to the HEC-RAS model were necessary.

3. **Interception Rearing Complex (IRC)**
   Assumes construction activities proceed based on findings made by the Effects Analysis (Jacobson, et al., 2016). Total amount of habitat was based on a current annual SWH implementation rate of about 130 ac/year per district for a total of 260 ac/year for 13 years. Distribution was based on conversations with the Effects Analysis team, who specified upper and lower boundaries based on their knowledge of larval pallid spawning locations, drift rates, and timing of interception. Sioux City is the upstream threshold for IRC placement, with the area between the Nebraska Platte River and the Osage River more likely to be successful. Chutes and existing habitat may be modified to meet IRC habitat criteria, but for purposes of HEC-RAS modeling these were not counted toward the target acreage. Habitat was placed to provide 0 – 6 ft of depth at median June flows. All of the SWH goal acreage was accomplished by top width widening.

Table 2 summarizes these geometries. For additional details regarding alternative geometry characteristics, habitat selection criteria, and flow regimes, please see the Missouri River Unsteady HEC-RAS Models Alternative Analysis Draft Report.

Table 2. Summary of Geometries

Characteristic	Geometry		
	No Action	**BiOp**	**IRC**
Target Acres of SWH	20 ac/mi	30 ac/mi	260 ac/yr for 13 years
Basis for SWH Target	Minimum 2003 BiOp target	Full 2003 BiOp target	Current annual SWH implementation rate
Existing Habitat	Counted, used 2014 SWH Report	Counted, used 2014 SWH Report	Not counted
Chutes	Modeled and counted	Modeled and counted	Modeled but not counted
Distribution	20 ac/mi per BiOp reach	30 ac/mi per BiOp reach	Located for optimal interception/retention
Reference Flow	August 50% Exceedance	1/3 Summer Low, 1/3 Median August, and 1/3 Spring Pulse	Median June
SWH Depth Criteria	0-5 ft	0-5 ft	0-6 ft
Additional Requirements	---	Floodplain connectivity	---

The following subsections detail the process of implementing the alternatives into the sediment model.

4.2 Differences Between Unsteady RAS and LMRSM Geometries

Care was taken to maintain consistency with the Unsteady RAS model in the baseline level of shallow water habitat and in how the above alternatives were coded. The LMRSM used the equivalent or nearby cross sections and the same final invert elevations of SWH and chutes as the unsteady RAS model. However, some changes were necessary due to differences in how the models were set up, including differences in LIDAR dates (which influenced the presence or absence of chute projects), cross section locations, and dike representations.

Most cross sections in the LMRSM line up with those in the Unsteady RAS model, but not every cross section included in the Unsteady RAS model has a corresponding LMRSM cross section. Furthermore, the LMRSM sections were occasionally offset in order to line up with locations of bathymetric data. Habitat locations from the Unsteady RAS model were applied to the nearest cross section in the LMRSM, provided the difference in locations was within 0.02 miles.

The two models include river structures such as dikes and revetments differently. The Unsteady RAS model uses permanent ineffective flow areas, whereas the LMRSM uses station elevation points to define the river structures. These differences resulted in a slight alteration to the methodology used to import habitat locations for the development of the three alternative geometries.

4.3 2012 Existing Conditions

For consistency, the chutes were imported from the Unsteady RAS model, which represents the 2012 existing condition, and merged into the LMRSM existing condition geometry. This was implemented to maintain consistency between models and to prevent changes in water surface elevations used to determine habitat locations. The chutes were imported in a manner that maintained the same distance between the main river channel and the center of the chute along with similar elevations.

Additionally, five chute projects (Benedictine Bottoms, Dalby, Cranberry Bend, Jameson Extension, and Cora Island) constructed after the calibration period of the Unsteady RAS model were imported into the sediment model using a standard chute template displayed in Figure 1. A triangular shaped channel bottom 300-ft wide ranging in depth from 0 to 5 feet at the August 50% reference flow was used as the chute template. Chutes were added as overbank conveyance in cross sections that intersect the chute alignment. All chutes were assigned a Manning's n value of 0.03, which is rougher than the main channel, but smoother than the 0.0412 selected for habitat widenings. Both chutes and channel widenings have lower roughness than the floodplain areas they replace. Updating the chutes also required moving ineffective flows and levees, as depicted in Figure 2.

Modifications for the three alternative geometries were made using this 2012 existing conditions geometry as the base.

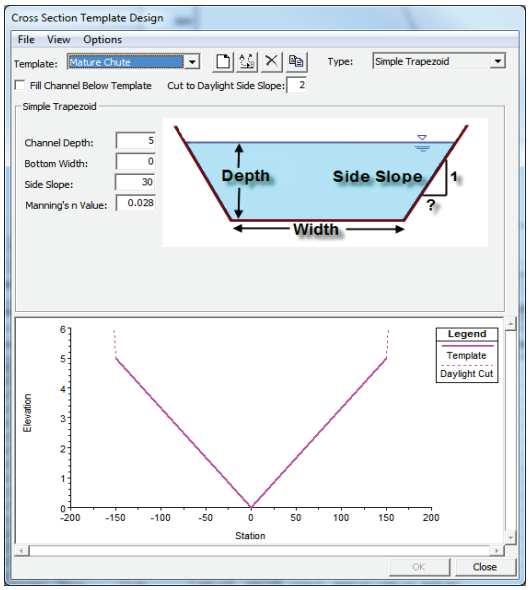

Figure 1. Mature chute bottom template

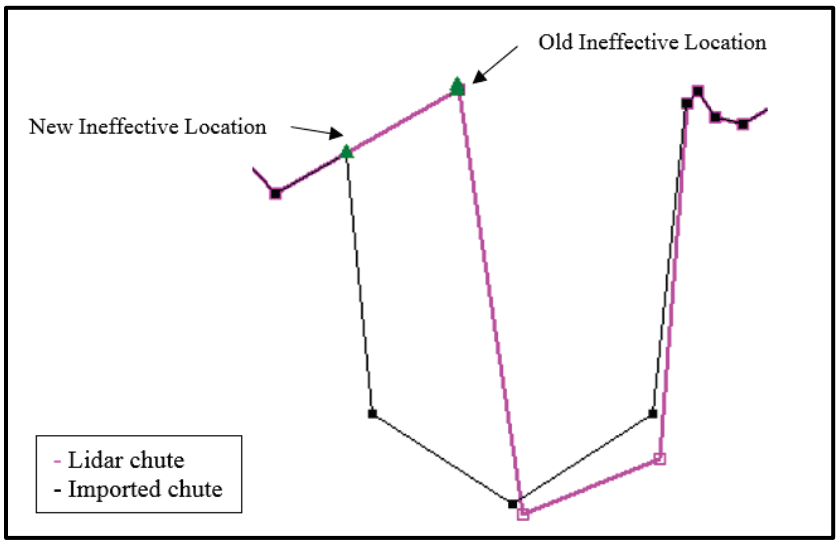

Figure 2. Adjustment to ineffective flow with imported chute

4.4 Top Width Widening

Three alternative geometries were made by applying varying levels of top width widening to the 2012 existing conditions geometry. The elevation for each widening alternative was the required

depth below the specified reference water surface as computed by the Unsteady RAS model (see the Unsteady RAS Model Appendix). Ineffective flow and levee points representing levees were set back to the edge of the widened section. Their elevations were left unaltered with the assumption that existing flood protection would be set back to provide the same height of protection rather than removed. Figure 3 provides an example of ineffective flow area adjustments. Bank stations were readjusted to the lowest point of the river structure or to the habitat invert location on a widening.

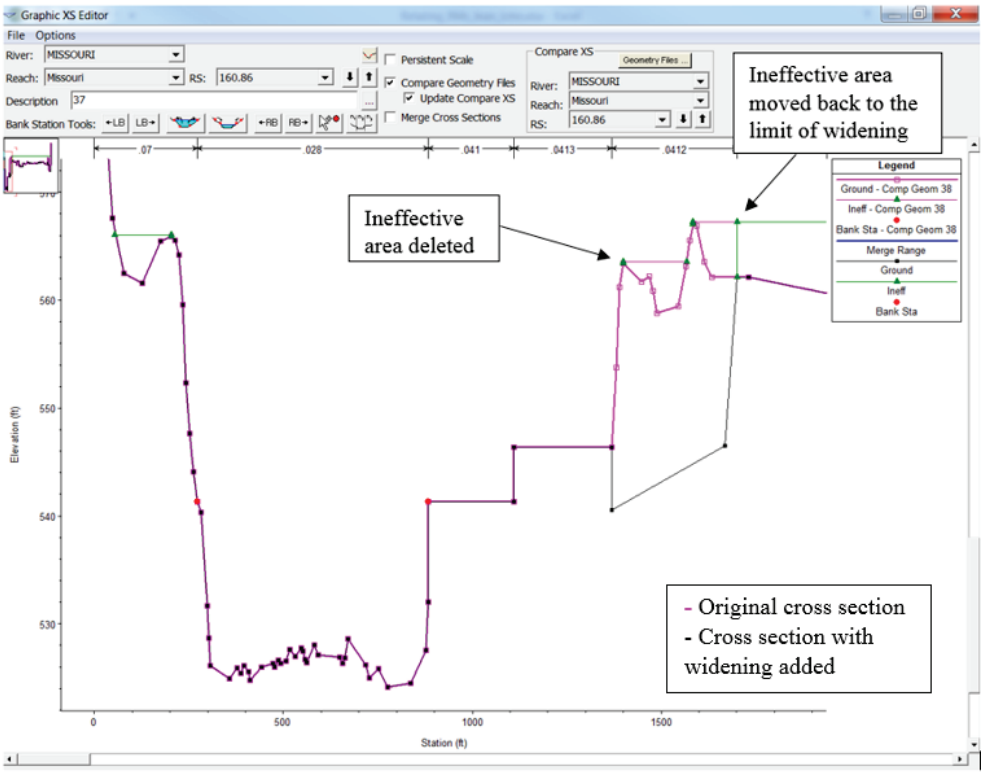

Figure 3. Example ineffective flow adjustment following top width widening

Widened locations in all geometries were assigned a Manning's n-value of 0.0412, which is rougher than the main channel and smoother than the overbanks. As with the Unsteady RAS model, roughness larger than the main channel was selected to account for structure modifications necessary to maintain the navigation channel and habitat at the desired dimensions.

5. Hydrologic Inputs

The sediment modeling uses daily flows developed for each alternative as explained in the Unsteady RAS appendix. Uniform lateral flows were developed from these flows as explained in the Model Calibration Report.

6. Floodplain Deposition

Some floodplain deposition occurs during 22 of the 82 years, with 72% occurring during just the largest three floods (1993, 1951, and 2011). These volumes of sediment removed were computed and entered into the model using the same methodology as described in the Model Calibration Report. As seen in Table 3, the total floodplain deposition differs only slightly between alternatives.

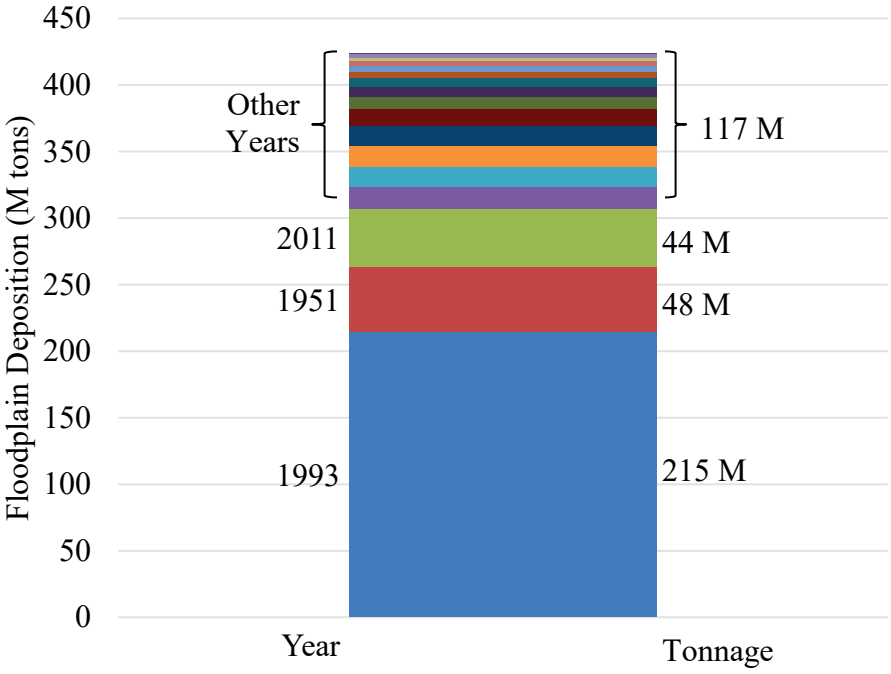

Figure 4. Floodplain Deposition (Alternative 1)

Table 3. Full Simulation (82 Years) Floodplain Deposition

Alternative	Floodplain Deposition (M tons)	Compared to Alternative 1 (%)
1	424	100
2	433	102
3	419	97
4	416	99
5	414	100
6	420	101

7. Dredging Condition

Two model simulation runs allow the modeling of the future commercial dredging. Both include the temporal and spatial distribution within each dredging segment as described in the Model Calibration Report, but differ in the dredging tonnage in each authorized segment. The first simulation includes the currently permitted level of commercial dredging, as defined by the 2015 permit record of decision (USACE 2016). This results in more than 2 ft of degradation (compared to the 2009 regulatory baseline) in much of the St. Joseph dredging segment by year 2033 which, according to the commercial dredging record of decision should trigger some adaptive management. The second simulation includes the tonnage shifted from the St. Joseph segment to the Waverly segment, which is meant to simulate one possible adaptive management strategy. Results from both simulations were annualized. Figure 4 graphs the 2009 – 2033 bed change (i.e. 19 annualized years of the "current dredging" and "shifted dredging" scenarios plus the observed change from 2009 – 2014) in the St. Joseph dredging segment. The MRRP alternatives comparisons uses an "adaptively shifted dredging" which includes 6 years of the "current dredging" and 13 years of the "shifted dredging" simulations. Please note that while some assumption was necessary for MRRP modeling purposes, this is not an official recommendation or prediction for adaptive management decisions by NWK Engineering, Planning, or Regulatory.

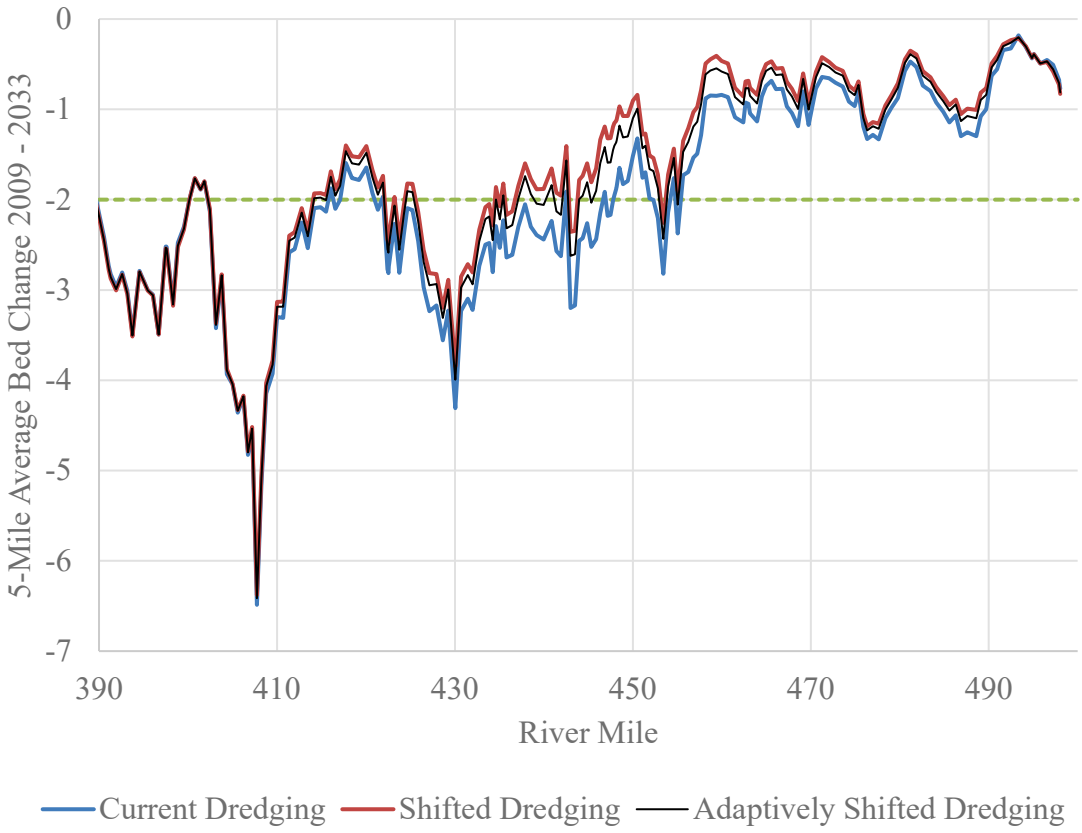

Figure 4. 5-Mile Average Bed Change Projection (2009 – 2033) under Three Dredging Scenarios. Alternative 1.

8. Alternatives Results

Figure 5 plots the 5-mile average bed change under the six alternatives. Each alternative includes measured bed change from 2009 to 2014 plus 6 years of average bed change under the "current dredging" condition plus 13 years of average bed change under the "shifted dredging" condition. Attachment 1 provides the bed changes at the MRRP Unsteady RAS model locations for each alternative in tabular form. Note that while the changes from 2009 to 2033 are fairly large, the differences amongst MRRP alternatives are fairly small.

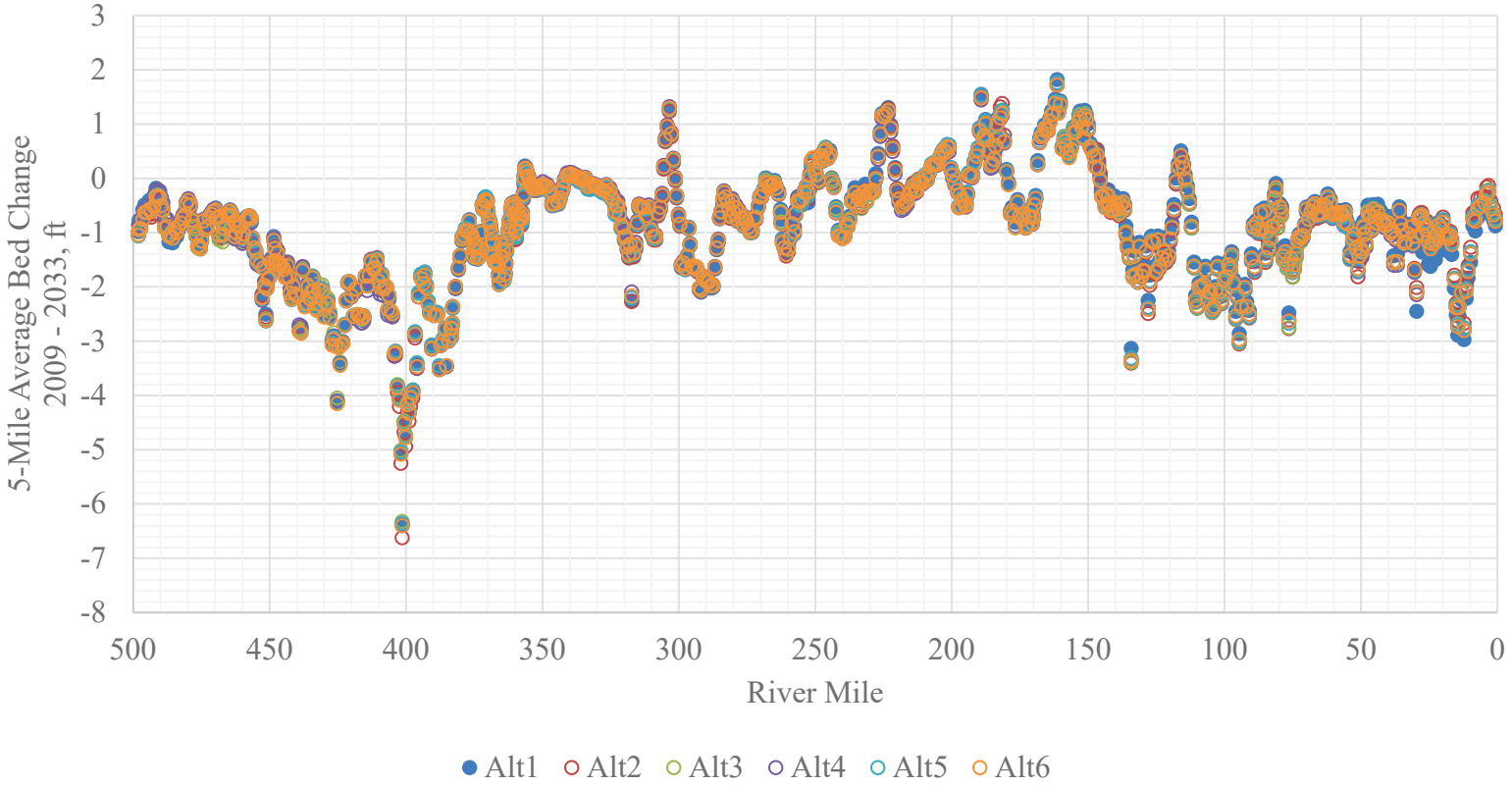

Figure 5. Alternatives Comparison

9. Comparison to Unsteady RAS 2033 Adjustment

The Unsteady RAS model team incorporated an earlier version (Feb 2018) of the sediment model output into their 2033 assessments. The updated results presented in this Appendix (July 2018) follow the same basic trends as the earlier output, as seen in Figure 6. Because the trends are similar, the project delivery team opted to use the earlier output for the 2033 Unsteady RAS model runs.

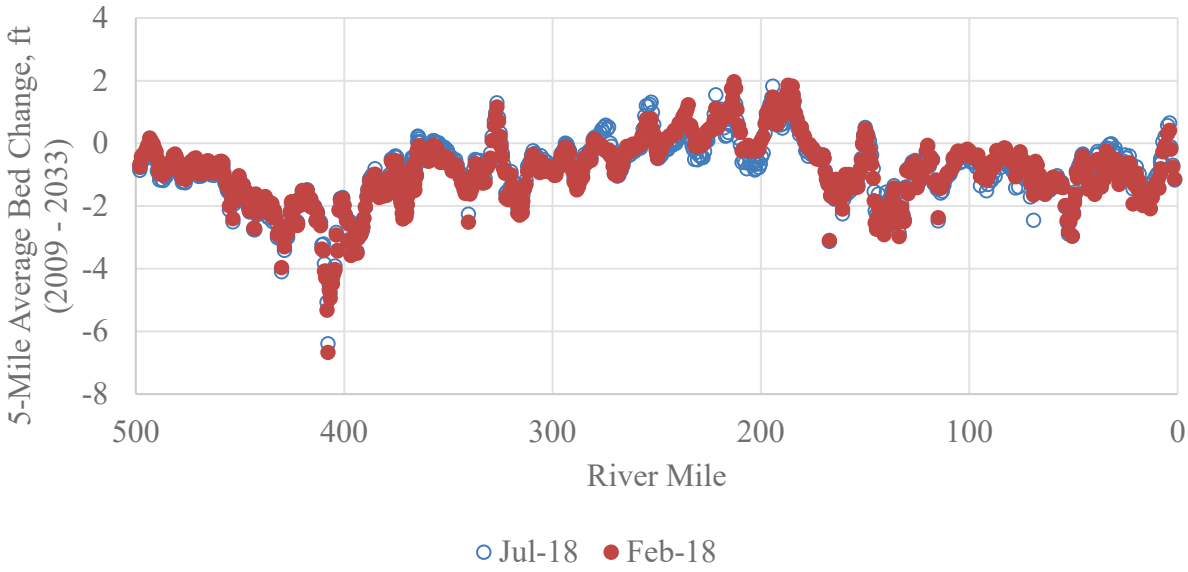

Figure 6. Comparison of Updated Sediment Model Output with Output Used in Unsteady RAS Appendix

10. Conclusions

This analysis indicates that none of the proposed MRRP alternatives will appreciably affect the long-term, reach-scale sediment condition of the river. The bed of the Missouri River has changed and will continue to change significantly since 2009 regardless of the alternatives.

11. References

Alexander, J.S., Jacobson, R.B., and Rus, D.L. (2013), Sediment transport and deposition in the lower Missouri River during the 2011 flood: U.S. Geological Survey Professional Paper 1798–F, 27 p., http://dx.doi.org/10.3133/pp1798f.

USACE (2009). Missouri River Bed Degradation Reconnaissance Study Section 905(b) (Water Resources Development Act of 1986) Analysis. U.S. Army Corps of Engineers, Kansas City District. Kansas City, MO.

USACE. (2011a). *Record of Decision for Authorization of Commercial Sand and Gravel Dredging on the Lower Missouri River.*

USACE. (2011b). *Final Environmental Impact Statement for Missouri River Commercial Dredging.*

USACE. (2013). Technical Report - Hydrologic Statistics, September 2013. Missouri River Basin Water Management Division, Omaha, Nebraska. http://www.nwd-mr.usace.army.mil/rcc/reports/pdfs/MRBWMTechReport-HydrologicStatistics_September2013.pdf .

USACE (2015a). Missouri River Bed and Water Surface Changes between 2009 and 2014 as They Relate to Renewal of Commercial Dredging Permits under Section 404 of Clean Water Act and Section 10 of the Rivers and Harbors Act (Section 404/10 Permits). Memorandum for CENWK-OR-R. July 14, 2015. U.S. Army Corps of Engineers, Kansas City District.

USACE (2015b). A Sediment Budget Approach to Stable Dredging Levels on the Lower Missouri River, 1994 to 2014. Memorandum for CENWK-OR-R. October 2, 2015. U.S. Army Corps of Engineers, Kansas City District.

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
498.1	-0.86	-1.05	-0.99	-0.97	-1.06	-1.04	479.81	-0.43	-0.42	-0.39	-0.38	-0.41	-0.41
497.93	-0.77	-0.94	-0.89	-0.88	-0.96	-0.94	479.09	-0.53	-0.52	-0.50	-0.46	-0.50	-0.49
497.25	-0.76	-0.93	-0.87	-0.86	-0.94	-0.92	478.4	-0.82	-0.81	-0.79	-0.74	-0.77	-0.76
496.53	-0.57	-0.76	-0.71	-0.70	-0.77	-0.75	477.64	-0.93	-0.94	-0.93	-0.87	-0.89	-0.88
495.79	-0.49	-0.67	-0.58	-0.57	-0.64	-0.63	476.99	-1.06	-1.06	-1.06	-1.03	-1.03	-1.03
495.07	-0.51	-0.69	-0.58	-0.57	-0.62	-0.63	476.34	-1.25	-1.25	-1.28	-1.26	-1.26	-1.26
494.19	-0.41	-0.67	-0.51	-0.50	-0.57	-0.58	475.92	-1.22	-1.23	-1.25	-1.24	-1.24	-1.23
493.34	-0.45	-0.71	-0.53	-0.51	-0.60	-0.61	475.38	-1.26	-1.28	-1.31	-1.29	-1.29	-1.29
492.5	-0.32	-0.65	-0.43	-0.41	-0.51	-0.52	474.94	-1.12	-1.14	-1.15	-1.15	-1.15	-1.15
491.64	-0.18	-0.42	-0.32	-0.25	-0.33	-0.33	474.29	-0.76	-0.77	-0.78	-0.78	-0.79	-0.79
490.95	-0.26	-0.42	-0.31	-0.21	-0.31	-0.32	473.62	-0.89	-0.91	-0.94	-0.94	-0.95	-0.95
490.33	-0.30	-0.39	-0.32	-0.23	-0.34	-0.35	472.78	-0.85	-0.86	-0.88	-0.87	-0.90	-0.90
489.71	-0.47	-0.52	-0.45	-0.35	-0.49	-0.51	472.06	-0.68	-0.69	-0.71	-0.70	-0.73	-0.72
489.11	-0.56	-0.58	-0.55	-0.45	-0.59	-0.59	471.28	-0.64	-0.66	-0.64	-0.62	-0.67	-0.67
488.59	-0.89	-0.85	-0.87	-0.72	-0.92	-0.92	470.58	-0.58	-0.60	-0.59	-0.57	-0.62	-0.61
487.61	-0.96	-0.86	-0.79	-0.74	-0.87	-0.89	469.77	-0.55	-0.58	-0.59	-0.56	-0.59	-0.58
486.89	-1.17	-1.05	-0.99	-0.92	-1.05	-1.07	469.14	-0.69	-0.72	-0.74	-0.71	-0.72	-0.72
486.32	-1.15	-1.03	-1.02	-0.95	-1.03	-1.05	468.58	-1.06	-1.09	-1.14	-1.05	-1.06	-1.05
485.59	-1.19	-1.09	-1.09	-1.04	-1.09	-1.10	467.9	-0.70	-0.73	-0.79	-0.71	-0.71	-0.70
484.89	-1.00	-0.94	-0.94	-0.92	-0.92	-0.93	467.31	-1.05	-1.10	-1.17	-1.05	-1.06	-1.04
484.11	-1.07	-1.00	-1.00	-0.98	-0.99	-1.00	466.82	-0.91	-0.96	-1.02	-0.91	-0.93	-0.91
483.45	-0.96	-0.90	-0.89	-0.87	-0.89	-0.90	466.09	-0.84	-0.89	-0.93	-0.83	-0.86	-0.85
482.6	-0.86	-0.82	-0.78	-0.78	-0.82	-0.82	465.6	-0.66	-0.70	-0.72	-0.65	-0.67	-0.67
481.89	-0.74	-0.72	-0.68	-0.69	-0.73	-0.74	464.97	-0.67	-0.70	-0.72	-0.66	-0.69	-0.69
481.2	-0.69	-0.67	-0.63	-0.63	-0.67	-0.68	464.51	-0.58	-0.62	-0.64	-0.59	-0.61	-0.61
480.59	-0.48	-0.47	-0.45	-0.44	-0.47	-0.47	463.97	-0.63	-0.68	-0.69	-0.68	-0.68	-0.68

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
463.17	-0.74	-0.79	-0.83	-0.82	-0.80	-0.80	448.49	-1.08	-1.11	-1.11	-1.11	-1.15	-1.14
462.66	-1.00	-1.06	-1.09	-1.12	-1.08	-1.08	448.15	-1.22	-1.26	-1.24	-1.25	-1.30	-1.29
462.41	-0.92	-0.97	-1.03	-1.05	-1.00	-0.99	447.78	-1.45	-1.47	-1.45	-1.47	-1.52	-1.51
461.5	-0.83	-0.88	-0.93	-0.96	-0.90	-0.89	447.51	-1.48	-1.49	-1.47	-1.47	-1.53	-1.53
460.68	-0.83	-0.87	-0.92	-0.94	-0.89	-0.88	447.16	-1.34	-1.35	-1.32	-1.32	-1.38	-1.38
459.97	-1.02	-1.07	-1.17	-1.20	-1.11	-1.09	446.83	-1.52	-1.53	-1.51	-1.50	-1.56	-1.56
459.4	-0.95	-1.01	-1.14	-1.15	-1.04	-1.02	446.33	-1.53	-1.54	-1.51	-1.51	-1.57	-1.57
458.72	-0.73	-0.79	-0.88	-0.88	-0.79	-0.77	445.88	-1.54	-1.54	-1.52	-1.52	-1.58	-1.58
458.18	-0.70	-0.75	-0.83	-0.82	-0.75	-0.72	445.33	-1.59	-1.59	-1.56	-1.56	-1.62	-1.63
457.68	-0.70	-0.76	-0.82	-0.81	-0.74	-0.69	444.86	-1.64	-1.64	-1.61	-1.60	-1.68	-1.68
457.23	-0.69	-0.74	-0.80	-0.79	-0.74	-0.71	444.36	-1.78	-1.78	-1.75	-1.75	-1.82	-1.82
456.82	-0.73	-0.78	-0.81	-0.82	-0.77	-0.74	443.98	-1.78	-1.79	-1.76	-1.74	-1.83	-1.83
456.22	-1.09	-1.15	-1.20	-1.21	-1.15	-1.10	443.49	-1.58	-1.58	-1.56	-1.54	-1.62	-1.61
455.64	-1.27	-1.33	-1.36	-1.37	-1.32	-1.28	442.99	-1.77	-1.77	-1.76	-1.74	-1.82	-1.81
455.05	-1.32	-1.37	-1.41	-1.42	-1.37	-1.34	442.53	-2.08	-2.07	-2.06	-2.03	-2.12	-2.11
454.63	-1.49	-1.54	-1.57	-1.58	-1.54	-1.50	441.92	-2.19	-2.19	-2.18	-2.15	-2.23	-2.23
453.44	-1.54	-1.56	-1.60	-1.62	-1.59	-1.58	441.42	-1.96	-1.94	-1.95	-1.90	-1.99	-1.99
452.8	-2.13	-2.16	-2.21	-2.25	-2.21	-2.20	440.85	-2.09	-2.08	-2.09	-2.04	-2.13	-2.13
452.31	-1.58	-1.60	-1.64	-1.65	-1.65	-1.65	439.96	-2.12	-2.11	-2.13	-2.07	-2.17	-2.17
451.88	-1.90	-1.93	-1.97	-1.99	-1.98	-1.99	439.19	-2.75	-2.75	-2.77	-2.70	-2.82	-2.82
451.41	-2.51	-2.56	-2.59	-2.61	-2.63	-2.62	438.53	-2.77	-2.78	-2.80	-2.72	-2.84	-2.86
451.09	-1.94	-1.98	-2.01	-2.03	-2.04	-2.04	437.88	-1.65	-1.66	-1.67	-1.62	-1.69	-1.71
450.52	-1.76	-1.80	-1.82	-1.83	-1.86	-1.85	437.14	-2.28	-2.29	-2.31	-2.25	-2.34	-2.37
449.99	-1.74	-1.78	-1.78	-1.80	-1.84	-1.82	436.46	-2.23	-2.25	-2.26	-2.21	-2.28	-2.31
449.44	-1.47	-1.51	-1.51	-1.52	-1.56	-1.55	435.82	-1.93	-1.96	-1.96	-1.92	-1.99	-1.99
448.89	-1.51	-1.54	-1.54	-1.55	-1.60	-1.59	435.395	-2.15	-2.17	-2.19	-2.15	-2.20	-2.21

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
435.01	-2.17	-2.20	-2.19	-2.17	-2.21	-2.23	419.24	-2.52	-2.57	-2.53	-2.58	-2.54	-2.54
434.61	-2.04	-2.05	-2.04	-2.03	-2.06	-2.09	418.44	-2.04	-2.06	-2.03	-2.08	-2.05	-2.04
434.21	-1.82	-1.81	-1.80	-1.82	-1.82	-1.84	417.73	-2.51	-2.54	-2.51	-2.57	-2.53	-2.51
433.805	-2.06	-2.06	-2.03	-2.06	-2.05	-2.08	417.09	-2.52	-2.55	-2.51	-2.58	-2.53	-2.52
433.44	-2.36	-2.37	-2.31	-2.36	-2.37	-2.39	416.55	-2.57	-2.60	-2.58	-2.66	-2.60	-2.58
432.73	-2.39	-2.39	-2.31	-2.38	-2.38	-2.43	416.07	-2.57	-2.60	-2.58	-2.66	-2.60	-2.58
432.01	-2.01	-2.02	-1.94	-2.01	-2.01	-2.05	415.5	-2.53	-2.56	-2.55	-2.62	-2.56	-2.55
431.44	-2.28	-2.30	-2.20	-2.27	-2.28	-2.32	414.9	-1.79	-1.81	-1.80	-1.86	-1.81	-1.80
430.71	-2.05	-2.06	-1.97	-2.04	-2.05	-2.08	414.2	-1.97	-1.98	-1.98	-2.07	-1.99	-1.98
430.04	-2.51	-2.54	-2.42	-2.51	-2.52	-2.56	413.47	-1.78	-1.79	-1.80	-1.89	-1.80	-1.80
429.27	-2.25	-2.28	-2.18	-2.25	-2.27	-2.30	412.8	-1.50	-1.49	-1.54	-1.63	-1.51	-1.53
428.65	-2.27	-2.31	-2.21	-2.28	-2.29	-2.33	412.01	-1.63	-1.60	-1.70	-1.80	-1.63	-1.67
427.92	-2.52	-2.56	-2.46	-2.52	-2.55	-2.58	411.39	-1.62	-1.58	-1.70	-1.80	-1.62	-1.65
427.13	-3.00	-3.05	-2.95	-3.01	-3.04	-3.07	410.68	-1.48	-1.46	-1.55	-1.63	-1.48	-1.51
426.48	-2.90	-2.94	-2.85	-2.91	-2.93	-2.97	410.01	-1.89	-1.86	-1.95	-2.05	-1.86	-1.90
425.87	-3.05	-3.08	-3.00	-3.05	-3.08	-3.09	409.49	-2.00	-1.98	-2.06	-2.14	-1.97	-2.00
425.22	-4.10	-4.12	-4.04	-4.10	-4.13	-4.15	408.79	-1.78	-1.77	-1.83	-1.91	-1.76	-1.79
424.66	-3.08	-3.09	-3.04	-3.08	-3.11	-3.12	408.26	-2.04	-2.03	-2.08	-2.16	-2.01	-2.04
424.24	-3.41	-3.42	-3.38	-3.41	-3.43	-3.45	407.74	-2.00	-2.01	-2.04	-2.10	-1.98	-1.99
423.77	-3.03	-3.05	-3.02	-3.04	-3.06	-3.06	407.19	-2.02	-2.02	-2.04	-2.09	-2.00	-1.99
423.2	-3.01	-3.03	-3.00	-3.02	-3.04	-3.05	406.75	-2.46	-2.46	-2.46	-2.52	-2.43	-2.41
422.439	-2.69	-2.70	-2.69	-2.71	-2.72	-2.71	406.25	-2.19	-2.18	-2.19	-2.24	-2.17	-2.15
421.93	-2.24	-2.25	-2.25	-2.26	-2.25	-2.26	405.6	-2.48	-2.47	-2.48	-2.52	-2.46	-2.44
421.35	-1.91	-1.93	-1.92	-1.93	-1.93	-1.92	405.01	-2.52	-2.52	-2.52	-2.55	-2.50	-2.49
420.75	-1.90	-1.92	-1.91	-1.93	-1.92	-1.91	404.36	-3.24	-3.28	-3.23	-3.27	-3.22	-3.23
420.04	-2.15	-2.18	-2.16	-2.19	-2.16	-2.17	403.81	-3.21	-3.27	-3.18	-3.22	-3.19	-3.21

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
403.14	-3.85	-3.95	-3.80	-3.84	-3.83	-3.85	385.66	-2.77	-2.77	-2.79	-2.79	-2.75	-2.78
402.47	-4.08	-4.21	-4.03	-4.07	-4.06	-4.09	385.15	-3.46	-3.46	-3.47	-3.47	-3.45	-3.45
401.86	-5.08	-5.25	-5.02	-5.07	-5.04	-5.08	384.4	-2.99	-2.98	-3.00	-3.00	-2.99	-2.99
401.41	-6.40	-6.62	-6.32	-6.38	-6.36	-6.40	383.65	-2.77	-2.76	-2.77	-2.76	-2.78	-2.76
400.76	-4.51	-4.68	-4.47	-4.51	-4.50	-4.52	383.41	-2.92	-2.91	-2.92	-2.90	-2.94	-2.90
400.15	-4.77	-4.94	-4.73	-4.77	-4.75	-4.77	383.24	-2.79	-2.78	-2.78	-2.76	-2.80	-2.76
399.53	-4.16	-4.31	-4.13	-4.17	-4.15	-4.17	383.01	-2.69	-2.69	-2.69	-2.66	-2.70	-2.67
398.86	-4.32	-4.47	-4.29	-4.33	-4.30	-4.33	382.89	-2.39	-2.39	-2.39	-2.36	-2.38	-2.36
398.31	-4.04	-4.20	-4.02	-4.07	-4.03	-4.05	381.89	-2.04	-2.02	-2.00	-1.99	-2.01	-1.99
397.477	-3.91	-4.05	-3.90	-3.96	-3.90	-3.95	380.87	-1.69	-1.67	-1.66	-1.64	-1.65	-1.65
396.71	-2.84	-2.94	-2.84	-2.89	-2.83	-2.88	380.28	-1.47	-1.45	-1.44	-1.42	-1.42	-1.43
396.04	-3.42	-3.51	-3.40	-3.49	-3.40	-3.47	379.53	-1.15	-1.13	-1.13	-1.10	-1.08	-1.11
395.5	-2.11	-2.18	-2.12	-2.18	-2.11	-2.18	378.85	-1.10	-1.07	-1.06	-1.05	-1.02	-1.05
394.54	-1.77	-1.83	-1.78	-1.83	-1.77	-1.84	378.26	-1.02	-0.98	-0.97	-0.96	-0.92	-0.96
393.74	-1.86	-1.92	-1.87	-1.92	-1.86	-1.93	377.43	-1.00	-0.96	-0.95	-0.93	-0.93	-0.96
393.18	-1.73	-1.77	-1.74	-1.79	-1.73	-1.79	376.76	-0.82	-0.78	-0.79	-0.76	-0.77	-0.79
392.59	-1.96	-2.00	-1.97	-2.02	-1.96	-2.02	376.11	-1.06	-1.01	-1.04	-0.98	-1.00	-1.03
391.93	-2.27	-2.31	-2.28	-2.32	-2.26	-2.32	375.71	-1.12	-1.07	-1.09	-1.05	-1.06	-1.10
391.29	-2.44	-2.49	-2.47	-2.49	-2.43	-2.49	375.33	-1.32	-1.27	-1.29	-1.24	-1.26	-1.30
390.57	-3.09	-3.14	-3.12	-3.14	-3.07	-3.14	375.07	-1.47	-1.41	-1.44	-1.38	-1.41	-1.45
389.75	-2.50	-2.52	-2.52	-2.53	-2.48	-2.53	374.76	-1.27	-1.21	-1.24	-1.19	-1.22	-1.25
389.01	-2.49	-2.51	-2.51	-2.52	-2.47	-2.52	374.43	-1.23	-1.17	-1.20	-1.16	-1.18	-1.21
388.51	-2.49	-2.51	-2.51	-2.52	-2.47	-2.52	374.02	-1.24	-1.19	-1.22	-1.17	-1.20	-1.23
387.86	-3.49	-3.51	-3.52	-3.53	-3.45	-3.52	373.79	-1.49	-1.43	-1.46	-1.42	-1.45	-1.47
387.32	-3.06	-3.07	-3.08	-3.08	-3.03	-3.08	373.46	-1.38	-1.34	-1.37	-1.34	-1.33	-1.36
386.62	-2.98	-2.99	-3.01	-3.01	-2.96	-3.00	373.15	-1.46	-1.42	-1.45	-1.42	-1.40	-1.44

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
372.86	-1.30	-1.26	-1.30	-1.28	-1.28	-1.29	364.65	-1.44	-1.43	-1.45	-1.41	-1.45	-1.44
372.47	-1.01	-0.97	-1.01	-0.99	-0.98	-0.99	364.34	-1.33	-1.33	-1.34	-1.31	-1.35	-1.33
372.13	-0.50	-0.47	-0.50	-0.48	-0.47	-0.49	364.05	-1.85	-1.86	-1.87	-1.82	-1.89	-1.85
371.83	-0.57	-0.54	-0.58	-0.55	-0.53	-0.56	363.73	-1.75	-1.77	-1.77	-1.73	-1.79	-1.76
371.47	-0.53	-0.49	-0.53	-0.51	-0.48	-0.52	363.43	-1.56	-1.57	-1.58	-1.54	-1.59	-1.56
371.14	-0.42	-0.36	-0.42	-0.39	-0.36	-0.41	363.14	-1.30	-1.34	-1.33	-1.29	-1.35	-1.31
370.83	-0.40	-0.35	-0.40	-0.38	-0.34	-0.39	362.85	-1.10	-1.15	-1.14	-1.09	-1.16	-1.11
370.54	-0.43	-0.37	-0.43	-0.40	-0.37	-0.42	362.54	-0.94	-1.00	-0.99	-0.93	-1.01	-0.96
370.26	-0.44	-0.40	-0.44	-0.42	-0.39	-0.43	362.33	-0.87	-0.95	-0.93	-0.88	-0.94	-0.89
369.96	-0.61	-0.56	-0.61	-0.59	-0.56	-0.60	362.17	-0.77	-0.85	-0.83	-0.77	-0.84	-0.78
369.66	-0.77	-0.73	-0.77	-0.75	-0.72	-0.76	361.84	-0.98	-1.11	-1.08	-1.00	-1.10	-1.01
369.38	-0.82	-0.78	-0.82	-0.80	-0.77	-0.81	361.54	-0.54	-0.62	-0.60	-0.55	-0.61	-0.56
369.05	-0.89	-0.85	-0.89	-0.87	-0.84	-0.88	361.23	-0.46	-0.54	-0.52	-0.47	-0.53	-0.48
368.73	-1.02	-0.98	-1.02	-1.00	-0.97	-1.01	360.91	-0.46	-0.54	-0.52	-0.47	-0.53	-0.48
368.48	-1.17	-1.13	-1.16	-1.15	-1.12	-1.15	360.6	-0.50	-0.60	-0.57	-0.52	-0.58	-0.52
368.19	-1.22	-1.18	-1.21	-1.20	-1.18	-1.21	360.29	-0.63	-0.75	-0.71	-0.66	-0.73	-0.66
367.89	-1.45	-1.41	-1.43	-1.42	-1.40	-1.43	360.15	-0.43	-0.52	-0.49	-0.46	-0.50	-0.45
367.57	-1.54	-1.50	-1.54	-1.52	-1.50	-1.53	359.84	-0.94	-1.13	-1.06	-1.00	-1.09	-0.99
367.03	-1.54	-1.50	-1.53	-1.52	-1.50	-1.53	359.55	-0.92	-1.11	-1.04	-0.98	-1.07	-0.96
366.75	-1.55	-1.52	-1.55	-1.54	-1.52	-1.54	359.39	-0.79	-0.96	-0.90	-0.84	-0.92	-0.83
366.48	-1.58	-1.55	-1.58	-1.56	-1.54	-1.57	359.26	-0.62	-0.76	-0.71	-0.66	-0.73	-0.65
366.23	-1.61	-1.58	-1.61	-1.59	-1.58	-1.61	358.91	-0.54	-0.66	-0.61	-0.57	-0.64	-0.57
366.06	-1.80	-1.76	-1.80	-1.77	-1.77	-1.80	358.57	-0.71	-0.85	-0.79	-0.75	-0.81	-0.74
365.84	-1.96	-1.92	-1.95	-1.92	-1.93	-1.95	358.26	-0.70	-0.84	-0.78	-0.74	-0.80	-0.73
365.43	-1.45	-1.43	-1.45	-1.42	-1.44	-1.45	357.94	-0.71	-0.85	-0.79	-0.75	-0.81	-0.74
365.1	-1.21	-1.20	-1.22	-1.18	-1.21	-1.21	357.63	-0.71	-0.86	-0.80	-0.75	-0.82	-0.75

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
357.3	-0.62	-0.77	-0.71	-0.67	-0.73	-0.66	343.57	-0.35	-0.39	-0.36	-0.32	-0.38	-0.35
357.06	-0.26	-0.39	-0.32	-0.29	-0.35	-0.29	343.09	-0.25	-0.29	-0.26	-0.22	-0.28	-0.25
356.76	0.05	-0.12	-0.03	0.02	-0.06	0.01	342.49	-0.17	-0.22	-0.18	-0.13	-0.21	-0.17
356.43	0.23	0.05	0.14	0.20	0.11	0.19	341.88	-0.04	-0.09	-0.06	-0.01	-0.08	-0.05
356.1	0.20	0.10	0.17	0.20	0.14	0.19	341.06	0.07	0.01	0.05	0.10	0.02	0.06
355.76	0.14	0.04	0.11	0.14	0.08	0.12	340.32	0.07	0.02	0.05	0.09	0.02	0.06
355.39	0.06	-0.02	0.04	0.07	0.01	0.05	339.66	0.09	0.04	0.08	0.12	0.04	0.08
355.01	0.03	-0.03	0.02	0.04	-0.01	0.02	338.79	0.07	0.02	0.06	0.09	0.02	0.06
354.62	-0.07	-0.14	-0.08	-0.06	-0.11	-0.09	337.96	0.04	-0.01	0.04	0.07	0.00	0.03
354.2	-0.11	-0.17	-0.12	-0.10	-0.14	-0.12	337.11	0.03	-0.01	0.03	0.05	0.00	0.03
353.82	-0.12	-0.17	-0.13	-0.10	-0.15	-0.13	336.5	0.00	-0.06	-0.01	0.02	-0.06	-0.01
353.45	-0.18	-0.22	-0.18	-0.16	-0.20	-0.19	335.67	-0.01	-0.07	-0.03	0.00	-0.07	-0.02
353.16	-0.17	-0.21	-0.18	-0.15	-0.20	-0.18	335	-0.02	-0.09	-0.04	-0.01	-0.09	-0.03
352.8	-0.17	-0.21	-0.17	-0.15	-0.19	-0.18	334.24	0.01	-0.03	0.00	0.02	-0.03	0.00
352.57	-0.17	-0.22	-0.18	-0.14	-0.20	-0.18	333.44	-0.13	-0.19	-0.16	-0.13	-0.20	-0.15
351.93	-0.18	-0.22	-0.19	-0.15	-0.20	-0.18	332.39	-0.12	-0.19	-0.15	-0.12	-0.21	-0.14
351.15	-0.14	-0.18	-0.15	-0.12	-0.16	-0.15	331.48	-0.10	-0.15	-0.12	-0.10	-0.16	-0.11
350.5	-0.16	-0.20	-0.17	-0.13	-0.19	-0.17	330.54	-0.12	-0.17	-0.14	-0.12	-0.18	-0.13
349.9	-0.10	-0.14	-0.11	-0.06	-0.13	-0.11	329.83	-0.14	-0.18	-0.15	-0.13	-0.19	-0.15
349.2	-0.14	-0.18	-0.15	-0.11	-0.18	-0.15	329.05	-0.17	-0.21	-0.19	-0.16	-0.23	-0.18
348.25	-0.14	-0.18	-0.15	-0.11	-0.18	-0.15	327.98	-0.21	-0.25	-0.23	-0.20	-0.27	-0.22
347.39	-0.21	-0.25	-0.22	-0.18	-0.25	-0.22	327.28	-0.21	-0.26	-0.23	-0.20	-0.27	-0.22
346.54	-0.47	-0.50	-0.48	-0.44	-0.50	-0.47	326.66	-0.13	-0.16	-0.14	-0.12	-0.17	-0.13
345.68	-0.47	-0.50	-0.47	-0.43	-0.49	-0.46	325.96	-0.27	-0.29	-0.28	-0.24	-0.32	-0.27
344.74	-0.41	-0.44	-0.41	-0.37	-0.44	-0.41	325.2	-0.22	-0.23	-0.23	-0.18	-0.26	-0.22
344.13	-0.44	-0.47	-0.44	-0.40	-0.47	-0.44	324.64	-0.36	-0.35	-0.36	-0.30	-0.39	-0.35

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
324.08	-0.40	-0.38	-0.39	-0.31	-0.42	-0.38	306.81	-0.55	-0.58	-0.54	-0.50	-0.54	-0.53
323.46	-0.65	-0.62	-0.64	-0.53	-0.67	-0.61	306.16	-0.32	-0.36	-0.31	-0.28	-0.32	-0.30
322.87	-0.54	-0.52	-0.53	-0.43	-0.55	-0.50	305.6	0.21	0.17	0.21	0.24	0.20	0.22
322.36	-0.53	-0.52	-0.52	-0.42	-0.53	-0.49	305	0.72	0.67	0.72	0.75	0.70	0.72
321.8	-0.70	-0.70	-0.69	-0.58	-0.68	-0.65	304.3	0.97	0.93	0.97	0.99	0.95	0.96
321.11	-0.93	-0.92	-0.90	-0.79	-0.88	-0.86	303.5	1.29	1.24	1.28	1.32	1.29	1.29
320.42	-0.96	-0.95	-0.94	-0.83	-0.92	-0.90	302.8	0.82	0.76	0.81	0.85	0.81	0.82
319.92	-1.15	-1.13	-1.11	-0.99	-1.08	-1.07	301.97	0.33	0.29	0.33	0.37	0.34	0.36
319.4	-1.14	-1.13	-1.10	-0.98	-1.07	-1.07	301.25	-0.01	-0.04	-0.01	0.02	-0.01	0.00
318.9	-1.32	-1.32	-1.29	-1.18	-1.27	-1.26	300.83	-0.33	-0.36	-0.33	-0.31	-0.33	-0.32
318.38	-1.47	-1.46	-1.43	-1.32	-1.41	-1.40	300.13	-0.68	-0.73	-0.69	-0.66	-0.69	-0.67
317.84	-1.27	-1.27	-1.24	-1.17	-1.23	-1.21	299.62	-0.84	-0.88	-0.85	-0.83	-0.86	-0.84
317.322	-2.26	-2.27	-2.20	-2.09	-2.20	-2.16	299.12	-1.59	-1.64	-1.61	-1.59	-1.62	-1.59
316.64	-1.44	-1.45	-1.40	-1.33	-1.40	-1.38	298.45	-1.53	-1.58	-1.55	-1.54	-1.57	-1.55
315.79	-1.27	-1.31	-1.25	-1.18	-1.27	-1.23	297.66	-1.64	-1.68	-1.66	-1.65	-1.68	-1.66
315.18	-0.85	-0.88	-0.85	-0.78	-0.85	-0.81	296.95	-1.42	-1.46	-1.43	-1.44	-1.45	-1.44
314.61	-0.52	-0.56	-0.52	-0.47	-0.53	-0.50	296.35	-0.90	-0.93	-0.91	-0.92	-0.93	-0.92
314.24	-0.54	-0.57	-0.55	-0.50	-0.55	-0.52	295.85	-1.20	-1.24	-1.21	-1.22	-1.23	-1.22
313.55	-0.56	-0.60	-0.57	-0.52	-0.58	-0.54	295.25	-1.60	-1.64	-1.61	-1.62	-1.63	-1.62
312.68	-0.55	-0.59	-0.57	-0.51	-0.57	-0.53	294.53	-1.64	-1.67	-1.65	-1.65	-1.66	-1.66
311.91	-0.72	-0.76	-0.73	-0.65	-0.73	-0.69	293.84	-1.63	-1.65	-1.63	-1.63	-1.63	-1.62
311.06	-0.55	-0.58	-0.56	-0.49	-0.56	-0.52	293.45	-1.66	-1.67	-1.65	-1.64	-1.65	-1.64
310.17	-0.99	-1.03	-1.00	-0.91	-1.00	-0.95	293.08	-1.71	-1.72	-1.70	-1.70	-1.70	-1.69
309.3	-1.11	-1.14	-1.11	-1.04	-1.10	-1.07	292.6	-2.05	-2.05	-2.01	-2.03	-2.03	-2.02
308.45	-1.12	-1.14	-1.11	-1.04	-1.10	-1.07	291.85	-2.10	-2.08	-2.05	-2.06	-2.07	-2.06
307.6	-0.67	-0.69	-0.66	-0.62	-0.66	-0.64	291.05	-1.85	-1.83	-1.80	-1.81	-1.83	-1.81

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
290.33	-1.91	-1.90	-1.86	-1.87	-1.89	-1.87	273.87	-0.96	-1.00	-1.00	-0.97	-0.98	-0.97
289.69	-1.94	-1.93	-1.89	-1.90	-1.92	-1.90	273.06	-0.95	-1.00	-0.98	-0.96	-0.97	-0.96
288.94	-1.95	-1.93	-1.90	-1.90	-1.92	-1.90	272.33	-0.71	-0.76	-0.73	-0.75	-0.74	-0.74
288.25	-2.02	-2.00	-1.97	-1.97	-2.00	-1.98	271.71	-0.70	-0.76	-0.72	-0.75	-0.73	-0.74
287.5	-2.01	-1.99	-1.96	-1.97	-1.99	-1.97	270.96	-0.50	-0.54	-0.51	-0.54	-0.53	-0.53
286.78	-1.67	-1.66	-1.63	-1.63	-1.65	-1.63	270.3	-0.32	-0.36	-0.34	-0.36	-0.34	-0.35
286.15	-1.32	-1.31	-1.28	-1.27	-1.30	-1.28	269.68	-0.30	-0.35	-0.32	-0.35	-0.33	-0.34
285.56	-1.17	-1.16	-1.14	-1.12	-1.15	-1.14	268.99	-0.20	-0.25	-0.23	-0.26	-0.23	-0.24
285.06	-0.74	-0.74	-0.72	-0.70	-0.74	-0.73	268.19	0.01	-0.05	-0.03	-0.08	-0.05	-0.07
284.53	-0.62	-0.65	-0.63	-0.59	-0.62	-0.61	267.5	-0.02	-0.09	-0.06	-0.11	-0.08	-0.09
283.98	-0.39	-0.45	-0.42	-0.38	-0.41	-0.39	266.92	-0.09	-0.15	-0.12	-0.16	-0.14	-0.14
283.5	-0.24	-0.31	-0.27	-0.23	-0.26	-0.25	266.16	-0.07	-0.13	-0.10	-0.14	-0.12	-0.12
282.88	-0.32	-0.38	-0.36	-0.31	-0.35	-0.34	265.58	-0.07	-0.13	-0.10	-0.14	-0.12	-0.12
282.11	-0.41	-0.47	-0.44	-0.36	-0.43	-0.43	264.96	-0.04	-0.10	-0.07	-0.11	-0.10	-0.10
281.61	-0.53	-0.59	-0.56	-0.49	-0.55	-0.55	264.31	-0.13	-0.19	-0.17	-0.20	-0.18	-0.18
281.14	-0.64	-0.74	-0.70	-0.60	-0.68	-0.68	263.47	-0.24	-0.29	-0.27	-0.30	-0.28	-0.28
280.51	-0.40	-0.44	-0.43	-0.37	-0.42	-0.42	262.7	-0.57	-0.63	-0.61	-0.64	-0.63	-0.63
279.83	-0.61	-0.66	-0.65	-0.57	-0.64	-0.64	262.515	-0.76	-0.84	-0.80	-0.83	-0.83	-0.83
279.13	-0.52	-0.56	-0.56	-0.49	-0.55	-0.54	262.1	-1.11	-1.19	-1.15	-1.17	-1.18	-1.19
278.6	-0.73	-0.79	-0.77	-0.70	-0.76	-0.75	261.38	-1.22	-1.30	-1.26	-1.26	-1.29	-1.28
277.9	-0.60	-0.65	-0.65	-0.58	-0.62	-0.62	260.7	-1.35	-1.43	-1.39	-1.37	-1.40	-1.40
277.12	-0.72	-0.77	-0.77	-0.71	-0.75	-0.73	259.88	-1.25	-1.36	-1.32	-1.25	-1.30	-1.30
276.36	-0.83	-0.88	-0.88	-0.81	-0.86	-0.85	259.19	-1.03	-1.12	-1.08	-1.05	-1.11	-1.08
275.7	-0.72	-0.76	-0.75	-0.71	-0.75	-0.73	258.46	-0.75	-0.88	-0.84	-0.78	-0.86	-0.83
275.1	-0.79	-0.83	-0.82	-0.78	-0.82	-0.80	257.73	-0.90	-1.03	-0.99	-0.92	-1.02	-0.98
274.46	-0.88	-0.93	-0.91	-0.87	-0.91	-0.89	257.14	-0.58	-0.67	-0.65	-0.59	-0.66	-0.64

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
256.47	-0.35	-0.43	-0.40	-0.34	-0.43	-0.41	238.54	-0.81	-0.85	-0.81	-0.84	-0.84	-0.85
255.8	-0.41	-0.51	-0.47	-0.39	-0.50	-0.43	238	-0.85	-0.90	-0.87	-0.89	-0.89	-0.89
254.96	-0.49	-0.47	-0.41	-0.35	-0.47	-0.39	237.4	-0.70	-0.76	-0.75	-0.78	-0.77	-0.77
254.04	-0.35	-0.33	-0.27	-0.22	-0.34	-0.26	236.69	-0.36	-0.41	-0.41	-0.43	-0.42	-0.43
253.31	-0.22	-0.19	-0.15	-0.14	-0.20	-0.15	236.05	-0.34	-0.41	-0.42	-0.42	-0.41	-0.42
252.67	-0.45	-0.38	-0.27	-0.19	-0.33	-0.25	235.47	-0.17	-0.25	-0.27	-0.26	-0.26	-0.27
252.02	-0.21	-0.08	0.02	0.08	-0.03	0.05	234.92	-0.40	-0.49	-0.54	-0.52	-0.51	-0.51
251.45	0.13	0.23	0.28	0.33	0.28	0.34	234.32	-0.24	-0.32	-0.36	-0.35	-0.34	-0.34
250.85	0.18	0.27	0.32	0.36	0.31	0.38	233.62	-0.27	-0.37	-0.42	-0.41	-0.40	-0.39
250.23	0.00	0.06	0.10	0.13	0.12	0.18	233.03	-0.35	-0.49	-0.56	-0.54	-0.52	-0.52
249.59	0.05	0.03	0.05	0.09	0.06	0.08	232.43	-0.18	-0.26	-0.29	-0.28	-0.27	-0.27
248.85	-0.06	-0.08	-0.05	-0.02	-0.03	-0.02	231.71	-0.11	-0.22	-0.26	-0.22	-0.24	-0.24
248.4	0.33	0.29	0.31	0.36	0.36	0.37	231.07	-0.27	-0.39	-0.44	-0.38	-0.42	-0.40
247.83	0.45	0.39	0.39	0.41	0.42	0.42	230.41	-0.14	-0.26	-0.30	-0.25	-0.28	-0.27
247.32	0.36	0.32	0.35	0.35	0.34	0.34	229.7	-0.18	-0.25	-0.28	-0.25	-0.26	-0.25
246.77	0.53	0.50	0.52	0.50	0.51	0.50	229	-0.13	-0.21	-0.24	-0.21	-0.23	-0.22
246.2	0.57	0.54	0.56	0.52	0.54	0.53	228.4	-0.15	-0.22	-0.26	-0.23	-0.24	-0.23
245.39	0.44	0.40	0.40	0.36	0.38	0.38	227.77	0.09	0.01	-0.03	0.00	-0.01	0.00
244.7	0.52	0.48	0.46	0.43	0.45	0.44	227	0.46	0.41	0.36	0.35	0.40	0.40
243.96	0.01	0.00	-0.02	-0.07	-0.04	-0.06	226.16	0.87	0.83	0.78	0.77	0.83	0.82
243.19	-0.10	-0.11	-0.12	-0.17	-0.15	-0.16	225.53	1.19	1.16	1.12	1.10	1.16	1.15
242.4	-0.52	-0.56	-0.56	-0.64	-0.59	-0.63	224.81	1.18	1.15	1.12	1.09	1.14	1.14
241.63	-0.96	-1.01	-1.00	-1.05	-1.02	-1.06	224.06	1.24	1.22	1.17	1.13	1.20	1.19
240.91	-0.97	-1.02	-1.01	-1.06	-1.04	-1.06	223.27	1.31	1.28	1.24	1.18	1.25	1.26
240.08	-1.05	-1.10	-1.06	-1.10	-1.09	-1.11	222.4	0.98	0.96	0.92	0.85	0.93	0.92
239.32	-1.03	-1.08	-1.03	-1.06	-1.07	-1.08	221.69	0.60	0.59	0.55	0.50	0.55	0.55

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
220.78	0.20	0.18	0.15	0.08	0.15	0.15	201.6	0.62	0.59	0.62	0.53	0.62	0.59
220.03	-0.19	-0.19	-0.22	-0.28	-0.22	-0.22	200.99	0.61	0.57	0.60	0.49	0.61	0.57
219.31	-0.35	-0.35	-0.38	-0.45	-0.39	-0.38	200.29	0.20	0.18	0.19	0.13	0.20	0.17
218.49	-0.49	-0.49	-0.52	-0.59	-0.53	-0.53	199.71	0.09	0.06	0.09	0.00	0.09	0.05
217.69	-0.46	-0.47	-0.50	-0.57	-0.50	-0.50	198.89	-0.08	-0.10	-0.08	-0.13	-0.07	-0.09
217	-0.40	-0.40	-0.45	-0.53	-0.45	-0.45	197.96	-0.20	-0.22	-0.22	-0.25	-0.19	-0.23
216.3	-0.38	-0.38	-0.42	-0.48	-0.41	-0.42	197.43	-0.52	-0.52	-0.53	-0.54	-0.50	-0.54
215.48	-0.24	-0.23	-0.27	-0.34	-0.27	-0.28	197.035	-0.30	-0.30	-0.30	-0.31	-0.28	-0.30
214.72	-0.19	-0.17	-0.20	-0.27	-0.21	-0.22	196.54	-0.52	-0.52	-0.52	-0.53	-0.50	-0.53
214.09	-0.11	-0.08	-0.12	-0.19	-0.13	-0.14	196.29	-0.39	-0.39	-0.40	-0.40	-0.36	-0.39
213.53	-0.19	-0.15	-0.20	-0.28	-0.21	-0.24	195.69	-0.42	-0.43	-0.44	-0.42	-0.39	-0.43
212.86	-0.20	-0.17	-0.20	-0.26	-0.21	-0.24	195.13	-0.46	-0.48	-0.49	-0.52	-0.46	-0.50
212.2	-0.03	-0.01	-0.03	-0.08	-0.04	-0.06	194.76	-0.45	-0.47	-0.49	-0.53	-0.44	-0.50
211.55	-0.06	-0.06	-0.05	-0.11	-0.06	-0.09	194.33	-0.26	-0.28	-0.30	-0.33	-0.25	-0.30
210.71	-0.06	-0.08	-0.05	-0.11	-0.06	-0.09	193.84	0.10	0.07	0.05	0.03	0.09	0.06
209.84	0.06	0.03	0.06	0.02	0.06	0.03	193.29	0.11	0.08	0.06	0.04	0.10	0.07
209.06	-0.01	-0.04	0.01	-0.03	0.00	-0.02	192.39	0.08	0.05	0.02	0.01	0.08	0.03
208.34	0.10	0.08	0.13	0.10	0.12	0.10	191.7	0.32	0.29	0.27	0.26	0.32	0.27
207.45	0.23	0.20	0.26	0.22	0.26	0.24	190.95	0.45	0.41	0.39	0.39	0.44	0.41
206.72	0.27	0.24	0.29	0.26	0.29	0.26	190.42	0.56	0.52	0.50	0.50	0.56	0.52
205.98	0.26	0.24	0.28	0.25	0.28	0.26	189.78	0.93	0.89	0.86	0.85	0.92	0.88
205.3	0.26	0.24	0.28	0.25	0.28	0.26	189.16	1.55	1.50	1.46	1.45	1.53	1.48
204.5	0.36	0.35	0.39	0.35	0.38	0.37	188.39	0.76	0.75	0.72	0.71	0.77	0.72
203.68	0.47	0.44	0.49	0.44	0.49	0.46	188.06	0.83	0.81	0.79	0.78	0.82	0.78
202.98	0.52	0.50	0.54	0.49	0.54	0.51	187.55	1.08	1.06	1.03	1.01	1.06	1.00
202.24	0.49	0.47	0.51	0.45	0.51	0.48	186.97	0.77	0.77	0.75	0.72	0.76	0.71

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
186.35	0.49	0.52	0.48	0.44	0.49	0.51	170.13	-0.65	-0.70	-0.72	-0.74	-0.69	-0.72
185.79	0.23	0.25	0.21	0.19	0.23	0.24	169.73	-0.44	-0.49	-0.50	-0.52	-0.47	-0.49
185.024	0.25	0.27	0.23	0.20	0.25	0.27	169.13	-0.31	-0.37	-0.36	-0.39	-0.35	-0.37
184.44	0.35	0.42	0.32	0.30	0.35	0.35	168.54	0.32	0.26	0.27	0.25	0.28	0.26
183.97	0.58	0.68	0.56	0.53	0.59	0.60	167.81	0.74	0.66	0.68	0.66	0.68	0.66
183.41	0.97	1.09	0.95	0.91	0.98	1.00	167.21	0.84	0.76	0.78	0.77	0.79	0.77
182.69	0.74	0.84	0.71	0.68	0.75	0.77	166.55	0.87	0.79	0.81	0.80	0.82	0.80
182.2	1.18	1.31	1.15	1.09	1.19	1.11	165.91	0.98	0.90	0.93	0.92	0.94	0.92
181.49	1.25	1.38	1.22	1.15	1.25	1.19	165.22	0.97	0.88	0.91	0.90	0.92	0.90
180.68	0.72	0.80	0.69	0.65	0.70	0.67	164.61	0.96	0.88	0.90	0.89	0.91	0.89
179.9	0.16	0.13	0.13	0.13	0.14	0.12	163.99	1.11	1.04	1.06	1.05	1.06	1.04
179.15	-0.07	-0.11	-0.11	-0.10	-0.10	-0.12	163.45	1.24	1.16	1.19	1.17	1.19	1.16
178.52	-0.61	-0.65	-0.66	-0.65	-0.65	-0.66	162.7	1.26	1.18	1.21	1.20	1.21	1.19
177.91	-0.53	-0.58	-0.60	-0.58	-0.59	-0.59	162.04	1.46	1.37	1.41	1.39	1.41	1.38
177.28	-0.61	-0.67	-0.69	-0.67	-0.68	-0.68	161.35	1.82	1.71	1.76	1.74	1.76	1.72
176.72	-0.81	-0.89	-0.91	-0.88	-0.89	-0.90	160.86	1.27	1.20	1.23	1.22	1.24	1.20
175.86	-0.39	-0.43	-0.45	-0.42	-0.43	-0.44	160.26	1.43	1.35	1.39	1.37	1.39	1.35
175.08	-0.64	-0.69	-0.70	-0.69	-0.68	-0.69	159.47	0.59	0.54	0.58	0.55	0.56	0.54
174.26	-0.69	-0.74	-0.76	-0.74	-0.73	-0.75	158.82	0.77	0.71	0.76	0.72	0.72	0.69
173.71	-0.60	-0.65	-0.67	-0.66	-0.65	-0.66	158.31	0.69	0.62	0.68	0.64	0.64	0.60
172.92	-0.85	-0.90	-0.92	-0.92	-0.87	-0.91	157.63	0.59	0.51	0.56	0.52	0.51	0.48
172.35	-0.82	-0.86	-0.88	-0.88	-0.84	-0.87	156.99	0.48	0.41	0.46	0.42	0.41	0.38
171.77	-0.66	-0.70	-0.72	-0.72	-0.68	-0.71	156.23	0.63	0.56	0.60	0.57	0.55	0.53
171.3	-0.66	-0.70	-0.71	-0.71	-0.68	-0.71	155.37	0.95	0.87	0.91	0.88	0.86	0.85
170.88	-0.55	-0.58	-0.60	-0.60	-0.57	-0.60	154.4	0.95	0.86	0.91	0.87	0.86	0.86
170.44	-0.78	-0.81	-0.84	-0.85	-0.80	-0.83	153.45	1.16	1.05	1.11	1.07	1.06	1.05

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
152.93	1.24	1.12	1.18	1.13	1.13	1.12	138.1	-0.39	-0.52	-0.49	-0.47	-0.47	-0.48
152.36	1.02	0.95	0.97	0.94	0.95	0.94	137.24	-0.37	-0.47	-0.45	-0.43	-0.43	-0.44
151.74	0.80	0.74	0.76	0.73	0.74	0.74	136.61	-0.47	-0.58	-0.56	-0.54	-0.54	-0.55
151.18	1.25	1.15	1.19	1.16	1.18	1.16	136.1	-0.88	-1.04	-1.01	-0.99	-0.97	-0.99
150.68	1.17	1.07	1.10	1.08	1.10	1.08	135.61	-1.12	-1.29	-1.26	-1.23	-1.22	-1.24
149.92	1.01	0.89	0.92	0.91	0.92	0.91	134.89	-1.30	-1.48	-1.47	-1.43	-1.42	-1.43
149.3	0.65	0.57	0.59	0.59	0.59	0.58	134.25	-3.13	-3.41	-3.39	-3.34	-3.31	-3.36
148.66	0.59	0.52	0.53	0.53	0.54	0.51	133.66	-1.68	-1.83	-1.82	-1.80	-1.78	-1.80
147.9	0.47	0.43	0.42	0.42	0.42	0.40	133.12	-1.34	-1.45	-1.44	-1.42	-1.42	-1.43
147.33	0.28	0.27	0.22	0.23	0.22	0.20	132.47	-1.66	-1.78	-1.78	-1.76	-1.76	-1.77
146.8	0.51	0.54	0.45	0.47	0.45	0.43	131.84	-1.79	-1.92	-1.91	-1.88	-1.89	-1.90
146.12	0.28	0.33	0.23	0.25	0.19	0.18	131.19	-1.18	-1.27	-1.26	-1.25	-1.25	-1.25
145.57	0.06	0.10	0.03	0.04	-0.02	-0.04	130.37	-1.68	-1.82	-1.81	-1.78	-1.79	-1.80
145.16	-0.24	-0.18	-0.26	-0.25	-0.32	-0.34	129.9	-1.59	-1.73	-1.69	-1.68	-1.70	-1.70
144.6	-0.27	-0.24	-0.30	-0.28	-0.33	-0.34	129.29	-1.59	-1.74	-1.70	-1.69	-1.71	-1.71
143.818	-0.41	-0.41	-0.47	-0.44	-0.52	-0.54	128.76	-1.25	-1.37	-1.34	-1.32	-1.33	-1.35
143.56	-0.21	-0.22	-0.25	-0.23	-0.28	-0.29	127.98	-2.25	-2.49	-2.41	-2.38	-2.38	-2.41
143.14	-0.35	-0.43	-0.41	-0.38	-0.44	-0.46	127.37	-1.79	-1.97	-1.91	-1.89	-1.89	-1.91
142.58	-0.21	-0.32	-0.30	-0.26	-0.30	-0.33	126.83	-1.07	-1.19	-1.14	-1.13	-1.13	-1.16
142.16	-0.39	-0.50	-0.48	-0.45	-0.47	-0.49	126.04	-1.10	-1.22	-1.17	-1.16	-1.16	-1.18
141.73	-0.46	-0.63	-0.59	-0.55	-0.58	-0.60	125.12	-1.60	-1.77	-1.71	-1.70	-1.69	-1.72
140.81	-0.44	-0.61	-0.57	-0.53	-0.54	-0.58	124.47	-1.06	-1.17	-1.13	-1.12	-1.12	-1.14
140.33	-0.33	-0.49	-0.46	-0.41	-0.43	-0.45	123.84	-1.52	-1.66	-1.62	-1.60	-1.60	-1.63
139.84	-0.36	-0.53	-0.50	-0.45	-0.47	-0.49	122.97	-1.37	-1.49	-1.45	-1.45	-1.45	-1.47
139.2	-0.44	-0.61	-0.58	-0.53	-0.54	-0.56	122.09	-1.27	-1.38	-1.35	-1.35	-1.34	-1.36
138.62	-0.50	-0.69	-0.65	-0.62	-0.61	-0.63	121.46	-1.40	-1.55	-1.53	-1.52	-1.50	-1.50

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
120.56	-1.33	-1.48	-1.44	-1.45	-1.42	-1.43	102.55	-1.56	-1.67	-1.66	-1.65	-1.64	-1.62
119.93	-1.03	-1.17	-1.13	-1.15	-1.10	-1.12	101.67	-2.02	-2.16	-2.14	-2.12	-2.12	-2.09
119.25	-0.82	-0.96	-0.92	-0.94	-0.90	-0.91	101	-2.17	-2.31	-2.30	-2.27	-2.27	-2.25
118.58	-0.48	-0.64	-0.59	-0.61	-0.57	-0.58	100.04	-1.78	-1.93	-1.92	-1.89	-1.88	-1.86
117.7	0.00	-0.11	-0.07	-0.09	-0.06	-0.07	99.28	-1.73	-1.88	-1.86	-1.83	-1.83	-1.81
116.95	0.27	0.16	0.20	0.19	0.21	0.20	98.48	-1.52	-1.65	-1.64	-1.61	-1.61	-1.59
116.02	0.51	0.37	0.41	0.40	0.43	0.42	97.84	-1.59	-1.73	-1.72	-1.69	-1.70	-1.67
115.39	0.37	0.25	0.28	0.28	0.29	0.29	97.37	-1.35	-1.47	-1.45	-1.43	-1.44	-1.41
114.96	0.26	0.13	0.15	0.16	0.18	0.18	96.7	-1.86	-1.98	-1.97	-1.95	-1.96	-1.93
114.45	0.08	-0.04	-0.03	-0.01	-0.01	0.00	95.9	-2.45	-2.60	-2.59	-2.55	-2.58	-2.54
113.65	-0.14	-0.25	-0.25	-0.23	-0.23	-0.21	95.29	-2.07	-2.20	-2.18	-2.14	-2.17	-2.15
112.88	-0.37	-0.48	-0.48	-0.46	-0.45	-0.44	94.6	-2.86	-3.05	-3.03	-2.97	-3.01	-2.97
112.09	-0.80	-0.91	-0.92	-0.89	-0.89	-0.88	93.85	-2.28	-2.42	-2.41	-2.36	-2.39	-2.36
111.21	-1.54	-1.65	-1.65	-1.63	-1.63	-1.62	92.54	-1.96	-2.07	-2.05	-2.01	-2.05	-2.01
110.57	-2.15	-2.29	-2.29	-2.26	-2.26	-2.24	91.81	-2.28	-2.42	-2.39	-2.36	-2.41	-2.36
110	-2.27	-2.39	-2.39	-2.37	-2.37	-2.35	90.94	-2.43	-2.57	-2.55	-2.51	-2.55	-2.51
109.29	-1.93	-2.05	-2.05	-2.03	-2.03	-2.01	90.18	-1.39	-1.53	-1.50	-1.47	-1.51	-1.47
108.48	-1.91	-2.03	-2.03	-2.01	-2.01	-1.98	89.46	-0.84	-0.94	-0.92	-0.90	-0.93	-0.90
107.65	-1.88	-1.99	-1.99	-1.97	-1.97	-1.95	88.92	-1.53	-1.73	-1.69	-1.67	-1.70	-1.63
107.03	-1.62	-1.72	-1.72	-1.70	-1.70	-1.68	88.25	-0.77	-0.90	-0.87	-0.85	-0.88	-0.83
106.23	-2.14	-2.26	-2.26	-2.24	-2.24	-2.22	87.64	-0.88	-1.02	-0.98	-0.97	-0.99	-0.95
105.63	-2.03	-2.14	-2.14	-2.12	-2.12	-2.10	86.82	-0.59	-0.69	-0.66	-0.65	-0.66	-0.64
105.21	-2.03	-2.14	-2.14	-2.12	-2.12	-2.09	86.11	-0.85	-1.03	-0.98	-0.95	-0.98	-0.93
104.49	-2.34	-2.47	-2.47	-2.45	-2.45	-2.42	85.46	-0.55	-0.66	-0.63	-0.61	-0.63	-0.60
103.86	-2.29	-2.42	-2.41	-2.40	-2.39	-2.37	85	-1.38	-1.55	-1.51	-1.48	-1.50	-1.46
103.19	-1.99	-2.11	-2.10	-2.09	-2.09	-2.06	84.57	-0.90	-1.05	-1.01	-0.98	-1.01	-0.98

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
83.89	-1.20	-1.36	-1.33	-1.28	-1.32	-1.28	66.85	-0.42	-0.51	-0.47	-0.49	-0.48	-0.47
83.22	-1.03	-1.17	-1.14	-1.10	-1.13	-1.10	66.2	-0.62	-0.74	-0.68	-0.71	-0.69	-0.67
82.71	-0.80	-0.96	-0.93	-0.88	-0.91	-0.88	65.51	-0.60	-0.72	-0.67	-0.69	-0.68	-0.65
82.33	-0.80	-0.94	-0.92	-0.87	-0.90	-0.88	64.86	-0.46	-0.56	-0.51	-0.53	-0.52	-0.50
81.73	-0.28	-0.44	-0.42	-0.35	-0.38	-0.36	64.38	-0.58	-0.70	-0.65	-0.67	-0.67	-0.65
81.1	-0.10	-0.24	-0.22	-0.16	-0.19	-0.17	63.56	-0.43	-0.54	-0.50	-0.53	-0.53	-0.50
80.42	-0.73	-0.91	-0.89	-0.79	-0.83	-0.81	62.92	-0.44	-0.58	-0.53	-0.56	-0.55	-0.51
79.8	-0.46	-0.57	-0.56	-0.50	-0.52	-0.52	62.12	-0.28	-0.40	-0.35	-0.38	-0.38	-0.34
79.13	-0.52	-0.69	-0.68	-0.59	-0.62	-0.62	61.27	-0.38	-0.49	-0.45	-0.48	-0.48	-0.44
78.54	-1.30	-1.51	-1.50	-1.41	-1.45	-1.43	60.4	-0.59	-0.74	-0.69	-0.73	-0.72	-0.67
77.76	-1.24	-1.42	-1.42	-1.34	-1.38	-1.35	59.73	-0.58	-0.70	-0.66	-0.70	-0.69	-0.64
77.09	-1.47	-1.66	-1.65	-1.57	-1.61	-1.58	58.98	-0.59	-0.68	-0.65	-0.68	-0.67	-0.63
76.42	-2.48	-2.77	-2.75	-2.60	-2.67	-2.63	57.85	-0.59	-0.68	-0.65	-0.68	-0.67	-0.63
75.6	-1.38	-1.56	-1.54	-1.45	-1.49	-1.47	57.18	-0.61	-0.69	-0.66	-0.70	-0.68	-0.64
74.99	-1.58	-1.82	-1.82	-1.70	-1.74	-1.72	56.61	-0.63	-0.73	-0.69	-0.74	-0.72	-0.67
74.39	-1.52	-1.67	-1.69	-1.60	-1.62	-1.60	56.15	-0.76	-0.86	-0.83	-0.87	-0.87	-0.80
73.76	-1.33	-1.46	-1.48	-1.39	-1.41	-1.39	55.67	-0.58	-0.66	-0.64	-0.66	-0.67	-0.61
73.18	-1.12	-1.22	-1.23	-1.16	-1.16	-1.15	55.03	-0.79	-0.89	-0.87	-0.89	-0.90	-0.84
72.64	-1.03	-1.13	-1.13	-1.09	-1.07	-1.07	54.03	-1.35	-1.49	-1.45	-1.47	-1.49	-1.42
71.96	-1.03	-1.16	-1.16	-1.13	-1.11	-1.10	53.11	-1.02	-1.22	-1.15	-1.16	-1.17	-1.11
71.29	-0.98	-1.10	-1.10	-1.09	-1.07	-1.05	52.48	-0.92	-1.15	-1.06	-1.08	-1.08	-1.03
70.65	-0.84	-0.93	-0.91	-0.91	-0.90	-0.88	51.77	-1.17	-1.42	-1.31	-1.34	-1.34	-1.29
70	-0.53	-0.62	-0.59	-0.60	-0.59	-0.56	51.13	-1.52	-1.82	-1.67	-1.72	-1.70	-1.66
69.21	-0.71	-0.80	-0.77	-0.78	-0.77	-0.75	50.64	-1.31	-1.54	-1.43	-1.48	-1.45	-1.43
68.26	-0.57	-0.66	-0.62	-0.64	-0.63	-0.61	50.02	-1.18	-1.39	-1.30	-1.34	-1.31	-1.30
67.51	-0.46	-0.56	-0.52	-0.54	-0.54	-0.51	49.57	-1.19	-1.45	-1.34	-1.41	-1.36	-1.35

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6	RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
49.03	-0.79	-0.95	-0.88	-0.94	-0.91	-0.90	33.02	-0.96	-1.01	-1.02	-1.06	-1.03	-1.01
48.53	-0.92	-1.05	-1.01	-1.07	-1.03	-1.03	31.79	-0.84	-0.89	-0.91	-0.94	-0.91	-0.89
48.09	-1.05	-1.22	-1.18	-1.27	-1.21	-1.22	31.02	-1.16	-1.19	-1.21	-1.25	-1.22	-1.20
47.47	-0.50	-0.62	-0.60	-0.66	-0.62	-0.64	30.45	-1.71	-1.66	-1.70	-1.73	-1.70	-1.68
46.96	-0.52	-0.67	-0.65	-0.72	-0.67	-0.69	30.03	-1.15	-1.05	-1.07	-1.10	-1.08	-1.06
46.43	-0.59	-0.70	-0.68	-0.73	-0.70	-0.71	29.63	-2.45	-2.01	-2.09	-2.14	-2.09	-2.10
46.03	-0.78	-0.93	-0.90	-0.97	-0.93	-0.94	28.9	-0.99	-0.70	-0.75	-0.76	-0.74	-0.75
45.52	-0.49	-0.57	-0.55	-0.59	-0.57	-0.58	28.5	-0.99	-0.65	-0.70	-0.72	-0.69	-0.71
44.9	-0.58	-0.70	-0.68	-0.73	-0.71	-0.71	28.12	-0.97	-0.63	-0.68	-0.69	-0.67	-0.69
44.45	-0.60	-0.81	-0.77	-0.86	-0.82	-0.82	27.78	-0.96	-0.63	-0.67	-0.69	-0.67	-0.68
43.85	-0.48	-0.63	-0.61	-0.67	-0.64	-0.63	27.35	-1.36	-0.97	-1.02	-1.03	-1.01	-1.04
42.96	-0.59	-0.75	-0.73	-0.80	-0.77	-0.77	26.97	-1.11	-0.76	-0.81	-0.81	-0.79	-0.82
42.06	-0.66	-0.77	-0.76	-0.82	-0.80	-0.79	26.34	-1.36	-0.84	-0.90	-0.91	-0.87	-0.93
41.34	-0.75	-0.86	-0.85	-0.91	-0.88	-0.86	25.89	-1.24	-0.78	-0.85	-0.86	-0.82	-0.88
40.78	-0.72	-0.86	-0.85	-0.91	-0.88	-0.86	25.29	-1.59	-1.06	-1.14	-1.15	-1.10	-1.17
39.86	-0.70	-0.83	-0.82	-0.87	-0.85	-0.83	24.52	-1.62	-1.23	-1.29	-1.29	-1.26	-1.30
39.08	-0.89	-1.00	-0.99	-1.05	-1.01	-1.01	23.93	-1.47	-1.14	-1.19	-1.20	-1.17	-1.21
38.51	-0.86	-0.96	-0.95	-1.01	-0.97	-0.97	23.27	-1.44	-1.06	-1.12	-1.12	-1.10	-1.14
37.97	-1.42	-1.55	-1.53	-1.60	-1.56	-1.55	22.66	-1.50	-1.10	-1.16	-1.16	-1.14	-1.18
37.22	-1.02	-1.11	-1.10	-1.14	-1.10	-1.10	22.1	-1.34	-0.98	-1.04	-1.02	-1.02	-1.06
36.63	-1.40	-1.55	-1.54	-1.60	-1.55	-1.54	21.36	-1.09	-0.81	-0.85	-0.84	-0.83	-0.86
35.97	-0.52	-0.59	-0.59	-0.63	-0.60	-0.59	20.66	-1.17	-0.85	-0.90	-0.90	-0.89	-0.93
35.46	-0.75	-0.83	-0.83	-0.87	-0.84	-0.83	19.91	-1.03	-0.72	-0.77	-0.79	-0.76	-0.81
35.02	-0.89	-0.96	-0.96	-1.00	-0.97	-0.96	19.12	-1.32	-1.00	-1.05	-1.08	-1.05	-1.09
34.19	-1.12	-1.18	-1.20	-1.24	-1.20	-1.19	18.4	-1.25	-0.95	-1.00	-1.03	-0.99	-1.04
33.61	-1.10	-1.17	-1.18	-1.22	-1.19	-1.17	17.68	-1.31	-1.02	-1.07	-1.10	-1.07	-1.11

Attachment 1- Five-mile Average Bed Change from 2009 to 2033 (ft)

RM	Alt1	Alt2	Alt3	Alt4	Alt5	Alt6
17.2	-1.24	-0.98	-1.02	-1.05	-1.03	-1.06
16.64	-1.41	-1.12	-1.17	-1.21	-1.18	-1.22
15.83	-2.03	-1.79	-1.83	-1.87	-1.84	-1.87
15.1	-2.52	-2.30	-2.34	-2.38	-2.36	-2.38
14.55	-2.89	-2.63	-2.68	-2.74	-2.70	-2.74
14.02	-2.53	-2.28	-2.33	-2.38	-2.35	-2.38
13.16	-2.24	-2.02	-2.07	-2.12	-2.08	-2.12
12.24	-2.97	-2.67	-2.75	-2.81	-2.76	-2.80
11.45	-2.21	-1.97	-2.04	-2.08	-2.04	-2.08
10.68	-1.83	-1.61	-1.68	-1.71	-1.68	-1.71
9.78	-1.55	-1.27	-1.35	-1.39	-1.36	-1.39
9.02	-0.88	-0.63	-0.72	-0.75	-0.72	-0.76
8.03	-0.97	-0.60	-0.73	-0.77	-0.72	-0.79
7.1	-0.73	-0.37	-0.51	-0.54	-0.50	-0.55
6.06	-0.64	-0.36	-0.47	-0.50	-0.47	-0.51
4.86	-0.56	-0.32	-0.41	-0.44	-0.42	-0.45
3.93	-0.39	-0.16	-0.24	-0.28	-0.25	-0.28
3.24	-0.34	-0.13	-0.21	-0.25	-0.23	-0.26
2.4	-0.66	-0.42	-0.51	-0.56	-0.53	-0.56
1.39	-0.77	-0.55	-0.63	-0.68	-0.65	-0.68
0.74	-0.88	-0.67	-0.75	-0.79	-0.76	-0.79