

4.12 VISUAL AND AESTHETIC RESOURCES

4.12.1 Introduction

This section describes the impact analysis relating to visual resources for the Proposed Action and alternatives, and the methods used to determine the potential impacts. Potential impacts on visual and aesthetic resources addressed in the impact analysis include:

- Visual impacts associated with new sand plants;
- Changes to a scenic vista or the existing visual character or quality of a site and its surroundings;
- Creation of a new source of substantial light or glare that would affect public views;
- Visual impacts caused by new or expanded facilities for alternate sources of sand and gravel; and
- Impacts to visual resources along a scenic highway associated with alternate sources of sand and gravel.

4.12.2 Assessment Methods

Impacts on visual and aesthetic resources were evaluated by comparing the proposed operations of the Proposed Action and alternatives with the existing visual and aesthetic resources. The analysis was based on:

- Google Earth and Maps Street View;
- Photographic documentation of key views of and from the Project area (October 13 through 15, 2009); and
- Review of the Project in regard to compliance with state and local ordinances and regulations and professional standards pertaining to visual quality.

It is expected that visual and aesthetic impacts would occur over the life of the Project, and possibly post-Project, because of potential permanent or semi-permanent changes to resources. Increasing the amount of tugs and barges on the river would create short-term visual impacts occurring over the approximate 5-year dredging permit period. Long-term visual impacts would result from permanent changes to the visual environment, such as land use changes associated with new sand plants and loss of views from reduced access to vantage points. No impacts to designated scenic highways or roads would be associated with dredging on the LOMR because none exist in the Project vicinity.

Potential changes in visual resources at alternate source locations due to new facilities or expanded mining or dredging operations are discussed qualitatively.

4.12.2.1 Professional Standards

Professional standards result from professional and direct expertise gained by staff working on visual analyses and consulting with other experienced staff, subconsultants, and clients on visual effects, including knowledge gained from public input on a broad range of projects. The methodology represents collective knowledge that is professionally agreed upon and represents common, general public concerns. According to professional standards, a project may be considered to cause an adverse impact if it would substantially:

- Conflict with local guidelines or goals related to visual quality;
- Alter the existing natural viewsheds, including changes in natural terrain;
- Alter the existing visual quality of the region or eliminate visual resources;
- Increase light and glare in the project vicinity;
- Result in backscatter light into the nighttime sky;
- Result in a reduction of sunlight or introduction of shadows in community areas;
- Obstruct or permanently reduce visually important features; or
- Result in long-term (that is, persisting for 2 years or more) adverse visual changes or contrasts to the existing landscape as viewed from areas with high visual sensitivity.

4.12.3 Proposed Action

4.12.3.1 Visual Impacts from New Construction

St. Joseph, Waverly, and Jefferson City Segments

Under the Proposed Action, no new facilities would be constructed in the St. Joseph, Waverly, or Jefferson City segments. Therefore, no visual impacts from new construction would occur.

Kansas City Segment

Under the Proposed Action, a new 20- to 60-acre sand plant would be built near RM 388 in the Kansas City segment. There are two possible plant site locations. Plant Site 1 is located just north of Waldron

Road and approximately 0.25 mile from the river at its northwestern edge; Plant Site 2 is located at the western terminus of Moores Ferry Road, immediately along the edge of the river. Both Plant Sites 1 and 2 are located at the same bend in the river, in an area that is currently in agricultural production and adjacent to riparian vegetation along the river that varies in width from 50 feet to over 600 feet. Waldron and Moores Ferry Roads terminate at a levee with an unpaved road. Several rural residential properties are located west of State Route 45 (River Road) and north and south of Waldron Road. Residents would have more immediate views of Plant Site 1, because it is closer to residences. Construction activities at Plant Site 2 would be more readily visible to recreationists on the river because construction would occur along the river's edge. Noah's Ark Airport, a private airport offering charter flights, is located west of River Road and between Waldron and Moores Ferry Roads (Airport-Data.com, One Sky Jets 2010). Flights leaving from the airport would view construction activities at either site from the air. Views from River Road would vary based on the presence of roadside vegetation.

Construction activities under the Proposed Action would create temporary changes in views of and from the source areas. Construction activities would introduce heavy equipment and associated vehicles, including dozers, graders, scrapers, and trucks, into the viewshed of recreationists on the river, public roadways, and rural residences. In addition, construction traffic would increase the presence of trucks on affected local roadways. The length of time needed to construct the facility is unknown.

As described above, the new facility would be located in the viewshed of nearby roadways, rural residences, and recreationists on the river with views and vistas that include the site, and would result in a permanent change in views in the immediate area. Under the Proposed Action, the new facility at either location would convert areas to unvegetated swaths of land and piles of sand and gravel with associated mining infrastructure, introducing these features into a viewshed where none presently exist. These features would contrast sharply with the more natural areas that were present prior to construction of the facility. The new facility would convert the land use from agricultural to industrial, and from land that is vegetated to land that is largely unvegetated, creating new landscape scars. In addition, the new facility would be visible from the river, part of the Lewis and Clark Water Trail that is identified in the SCORP as a trail of statewide importance. A new facility at either of these locations would introduce barges and dredging operations along portions of the river where none presently exist, which would affect views. Truck traffic on local roadways would greatly increase to transport sand and gravel; the increased traffic would negatively affect views from rural residences located along Waldron and River Roads and roadway users on affected roadways.

St. Charles Segment

Under the Proposed Action, a new facility would be constructed at RM 67 in Washington, Missouri, close to the Washington City River Access and Washington Bridge. The new facility would be visible from the river, which is part of the Lewis and Clark Water Trail, and could be visible from the Katy Trail. Both of these trails are identified in the SCORP as trails of statewide importance. The new facility would be located in a developed area, in proximity to low-density, suburban residential development; local roadways of Washington; and numerous businesses. Temporary construction-related impacts on visual resources associated with the new facility would include views of equipment onsite, cleared land, and trucks on local roads. A new facility at this location in the St. Charles segment would increase barges and dredging operations along portions of the river with ongoing operations nearby at the new Edward N. Rau Contractor Company Washington facility. The new facility and additional barges and tugs would be an addition to area views.

Alternate Sources

Alternate sources would not be required under the Proposed Action. Therefore, visual impacts at alternate source locations due to new construction would not occur.

4.12.3.2 Changes to Scenic Vistas, Scenic Routes, or Visual Character or Quality

St. Joseph Segment

Scenic vistas exist from bridge crossings, roadways along the river, trails, and residences and businesses with expansive views across agricultural fields. The Proposed Action would greatly increase the visual presence of tugs and barges on the river by increasing the frequency of trips back and forth to sand plants (see Table 4.4-1 in Section 4.4). The increase in barge trips would be 252 percent in the St. Joseph segment. More tugs and barges on the river under the Proposed Action also would affect views by recreationists on the river.

The increased dredging amounts compared to existing conditions (252 percent) would mean that much more dredging operations would be visible along the river. Dredging operations create noise and movement that would draw viewers' attention to these areas, making them more noticeable.

In addition, indirect visual impacts may result from changes in river bed elevations. To the extent that the river bed degrades and low-flow water surface elevations decrease, boat ramps could become less accessible and affect the ability of recreational boaters to access river views. Under the Proposed Action, short-term slight river bed degradation and low-flow water surface elevation decreases would

occur. In the long term, moderate to substantial river bed degradation and moderate to substantial decreases in low-flow water surface elevations would occur in the St. Joseph segment. The long term moderate or substantial geomorphic effects could result in boat ramps becoming less accessible, which would affect the ability of recreational boaters to access river views. All viewer groups would experience these adverse impacts to views.

Kansas City Segment

The Proposed Action would increase the occurrence of tugs and barges in views from nearby bridge crossings, roadways, trails, residences, and businesses with expansive views across agricultural fields and from the river itself. Barge trips would increase by 53 percent in the Kansas City segment (Table 4.4-1 in Section 4.4).

Dredging amounts would increase by 53 percent, resulting in more visible dredging activity along the shoreline. The noise and movement associated with dredging operations would draw viewers' attention to these areas.

Short-term moderate river bed degradation and moderate decreases in low-flow water surface elevations would occur. In the long term, substantial river bed degradation and substantial decreases in low-flow water surface elevations would occur. These effects could result in boat ramps becoming less accessible, which would affect the ability of recreational boaters to access river views. All viewer groups would be affected by this adverse, potential loss of views.

Waverly Segment

The Proposed Action would not substantially change the occurrence of tugs and barges in views from nearby bridge crossings, roadways, trails, residences, or businesses with expansive views across agricultural fields and from the river itself. The number of barge trips would increase by 48 percent in the Waverly segment (Table 4.4-1 in Section 4.4).

Dredging would increase by 48 percent in the Waverly segment under the Proposed Action, resulting in more dredging activity visible along the shoreline. The noise and movement associated with dredging operations would draw viewers' attention to these areas.

In the short term, slight river bed degradation or aggradation and slight increases or decreases in low-flow water surface elevations would occur. In the long term, slight river bed degradation and a slight decrease in low-flow water surface elevations would occur. These small effects would not likely lead to reduced visual access to the river.

Jefferson City Segment

The Proposed Action would increase the occurrence of tugs and barges in views from nearby bridge crossings, roadways, trails, residences, and businesses with expansive views across agricultural fields, and from the river itself. Barge trips would increase by 74 percent in the Jefferson City segment (Table 4.4-1 in Section 4.4).

Dredging would increase by 74 percent in the Jefferson City segment under the Proposed Action, resulting in more dredging activity visible along the shoreline. The noise and movement associated with dredging operations would draw viewers' attention to these areas.

Short-term moderate river bed degradation and slight decreases in low-flow water surface elevations would occur under the Proposed Action. In the long term, substantial river bed degradation and moderate decreases in low-flow water surface elevations would occur. These effects could result in boat ramps becoming less accessible, which would affect the ability of recreational boaters to access river views. All viewer groups would be affected by this adverse, potential loss of views.

St. Charles Segment

The Proposed Action would increase the occurrence of tugs and barges in views from nearby bridge crossings, roadways, trails, residences, and businesses with expansive views across agricultural fields, and from the river itself. Barge trips would increase by 166 percent in the St. Charles segment (Table 4.4-1 in Section 4.4).

Dredging amounts would increase by 166 percent in the St. Charles segment under the Proposed Action, resulting in much more dredging activity visible along the shoreline. The noise and movement associated with dredging operations would draw viewers' attention to these areas.

Short-term moderate river bed degradation and moderate decreases in low-flow water surface elevations would occur. In the long term, substantial river bed degradation and moderate to substantial decreases in low-flow water surface elevations would occur. These effects could result in boat ramps becoming less accessible, which would affect the ability of recreational boaters to access river views. All viewer groups would be affected by this adverse, potential loss of views.

Alternate Sources

Alternate sources would not be required under the Proposed Action. Therefore, changes to scenic vistas, scenic routes, or visual character or quality would not occur at alternate source locations.

4.12.3.3 Changes in Light or Glare

St. Joseph, Waverly, and Jefferson City Segments

The Proposed Action would substantially increase the number of barges that would be used and visible on the water; barges have surfaces that reflect light. Due to the reflective nature of the river's surface and because equipment would be moving and not stationary, the increased glare from equipment at any given location would not substantially increase existing glare. Sand and gravel stockpiles, which produce glare, would remain onshore.

Kansas City and St. Charles Segments

The Proposed Action would substantially increase the number of barges that would be used and visible on the water; barges have surfaces that reflect light. Due to the reflective nature of the river's surface and because equipment would be moving and not stationary, the increased glare from equipment at any given location would not substantially increase existing glare in the segment. Sand and gravel stockpiles, which produce glare, would be located onshore.

The new sand plants that would be constructed and would operate in these two segments under the Proposed Action would increase the amount of glare present in the segments by removing vegetative ground covering, exposing lighter subsurface material, and by removing trees and shrubs that absorb light and act as buffers to adjacent land uses. Nighttime lighting would be minimal at the new facilities and would not adversely affect viewer groups.

Alternate Sources

Alternate sources would not be required under the Proposed Action. Therefore, changes in light or glare would not occur at alternate source locations.

4.12.4 No Action Alternative

4.12.4.1 Visual Impacts from New Construction

All Segments

No new facilities would be constructed under the No Action Alternative. Therefore, no impacts to visual resources would result in any segment.

Alternate Sources

Under the No Action Alternative, alternate sources of sand and gravel would be provided by existing facilities and supplies in the short term. Construction of any new facilities needed to support long-term demand would create temporary changes in views of and from the alternate source areas.

Construction activities would introduce heavy equipment and associated vehicles, including dozers, graders, scrapers, and trucks, into the viewshed from the river, public roadways, and rural residences. In addition, construction traffic would increase the presence of trucks on affected local roadways. The length of time needed to construct individual projects is unknown, as are site-specific conditions that may affect visual resources and, in turn, sensitive receptors.

4.12.4.2 Changes to Scenic Vistas, Scenic Routes, or Existing Visual Character or Quality

All Segments

Scenic vistas and views are present from bridge crossings and roadways along the river. Under the No Action Alternative, current dredging permits would not be renewed, and dredging would cease on the LOMR. Barges and dredges no longer would be used and visible on the water. The remaining gravel and sand stockpiles would be exhausted onshore, leaving behind a denuded landscape scar and, potentially, deserted infrastructure. As described in Chapter 2, the future use of these facilities is speculative. As such, water-based and onshore views from residential areas, onshore recreational facilities, water-based recreation activities, roadways and bridges, and other public vantages could be affected by the No Action Alternative, but the extent of the impact would depend on the future use of the buildings and equipment.

The absence of barges and dredges on the LOMR under the No Action Alternative would improve visual resources because industrial watercraft and operations would no longer be present.

In the short term, slight to moderate river bed aggradation would occur under the No Action Alternative, along with changes in low-flow surface water elevations ranging from no change to a moderate increase. Views would not change as a result of changes in river bed and water surface elevations.

Alternate Sources

In the short term, alternate sources of sand and gravel would be provided by existing facilities and supplies. To support the long term demand, facilities may need to be expanded or new facilities may need to be constructed, including along the Mississippi and Kansas Rivers. New and expanded facilities under the No Action Alternative would convert areas that typically would be vegetated to large,

unvegetated swaths of land with piles of sand and gravel and associated mining infrastructure. This would expand existing landscape scars or create new ones. These features would contrast sharply with the more natural areas that were present prior to construction of new facilities or those natural areas surrounding the existing facilities, and would detract from existing views. In addition, dredging operations create noise and movement that would draw viewers' attention to these areas, making them more noticeable. All viewer groups would be affected.

Several highways designated by federal, state, and local jurisdictions as scenic highways are located in the vicinity of alternate source locations, including along the Mississippi and Kansas Rivers. Operations at some alternate source sites under the No Action Alternative would have the potential to adversely affect visual resources along a scenic highway while other sites would not.

4.12.4.3 Changes in Light or Glare

All Segments

Under the No Action Alternative, barges and dredges no longer would be used and visible on the water. Views of the river would improve because existing sources of light and glare would no longer exist. The absence of barges and dredges on the LOMR would improve visual resources because glare-causing elements, such as equipment and lighter-colored sand and gravel piles with large surface areas, would no longer be present.

Alternate Sources

In the short term, alternate sources of sand and gravel would be provided by existing facilities and supplies. Under the No Action Alternative, new facilities could be required for alternate sources of sand and gravel to meet the long-term demand, including along the Mississippi and Kansas Rivers. New facilities would convert areas that typically would be vegetated to large, unvegetated swaths of land with piles of sand and gravel and associated infrastructure. These features would increase the amount of glare by removing vegetative ground covering, exposing lighter subsurface material, and by removing trees and shrubs that absorb light and act as buffers to adjacent land uses. In addition, structures and site lighting have the potential to increase light and glare.

4.12.5 Alternative A

4.12.5.1 Visual Impacts from New Construction

St. Joseph, Waverly, and Jefferson City Segments

Under Alternative A, no new facilities would be constructed in the St. Joseph, Waverly, or Jefferson City segment. Therefore, no visual impacts from new construction would occur.

Kansas City Segment

Under Alternative A, a new 20- to 60-acre sand plant would be built near RM 388 in the Kansas City segment. Of the two possible plant locations, residents would have more immediate views of Plant Site 1. Construction activities at Plant Site 2 would be more readily visible to viewers on the river because construction would occur along the river's edge. Flights leaving from Noah's Ark Airport would view construction activities at either site from the air. Views from River Road would vary based on the presence of roadside vegetation.

Construction activities under Alternative A would create temporary changes in views of and from the source areas for viewers on the river, public roadways, and rural residences, in addition to increasing the presence of trucks on affected local roadways.

The presence of the new facility under Alternative A would result in a permanent change in views in the immediate area because of conversion of land to unvegetated swaths of land and piles of sand and gravel with associated mining infrastructure. These features would contrast sharply with the more natural areas that were present prior to construction of the facility. The new facility would be visible from the river, part of the Lewis and Clark Water Trail that is identified in the SCORP as a trail of statewide importance. A new facility at either location would introduce barges and dredging operations along portions of the river where none presently exist. Truck traffic on local roadways would greatly increase to transport sand and gravel; the increased traffic would negatively affect the views of rural residents located along Waldron and River Roads and roadway users on affected roadways.

St. Charles Segment

Under Alternative A, the new facility would be visible from the river, which is part of the Lewis and Clark Water Trail, and could be visible from the Katy Trail. Both trails are identified in the SCORP as trails of statewide importance. The new facility would be located in a developed area, in proximity to low-density, suburban residential development; local roadways of Washington; and numerous businesses.

Temporary construction-related impacts on visual resources associated with the new facility would include views of equipment on site, cleared land, and trucks on local roads. A new facility at this location would increase barges and dredging operations along portions of the river with ongoing operations nearby at the new Edward N. Rau Contractor Company Washington facility. The new facility and additional barges and tugs would be an addition to area views.

Alternate Sources

In the short term under Alternative A, alternate sources of sand and gravel would be provided by existing facilities and supplies. In the long term, the market would respond by supporting construction of new facilities to meet demand, which would create temporary changes in views of and from the alternate source areas. In general, construction activities would introduce heavy equipment and associated vehicles, including dozers, graders, scrapers, and trucks, into the viewshed from nearby rivers, public roadways, and rural residences. In addition, construction traffic would increase the presence of trucks on affected local roadways.

4.12.5.2 Changes to Scenic Vistas, Scenic Routes, or Existing Visual Character or Quality

St. Joseph Segment

Scenic vistas exist from bridge crossings, roadways along the river, trails, and residences and businesses with expansive views across agricultural fields. Alternative A would slightly increase the visual presence of tugs and barges on the river by increasing the number of trips by 7 percent (see Table 4.4-1 in Section 4.4). Over the course of 1 year, this increase would not be noticeable and is considered a negligible adverse impact on views.

The increased dredging amounts compared to existing conditions (7 percent) would mean that more dredging operations would become visible along the river. Dredging operations create noise and movement that would draw viewers' attention to these areas, making them more noticeable.

In the short term, slight river bed degradation or aggradation would occur. In the long term, slight river bed degradation and a slight decrease in low-flow water surface elevations would occur. These slight changes likely would not result in substantial changes in accessing views from boat ramps.

Kansas City, Jefferson City, and St. Charles Segments

Alternative A would result in a 73 to 80 percent decrease in both dredging and the number of barges that would be visible on the water in each of the Kansas City, Jefferson City, and St. Charles segments

(see Table 4.4-1 in Section 4.4). Reducing the number of barges on the river would benefit the visual character and quality in these segments. Decreases in dredging would remove some dredging operations from views of the river and river banks. The new facilities in the Kansas City and St. Charles segments would change views of these segments.

Changes in river bed and surface water elevations under Alternative A would be slight in both the short term and the long term in these segments. Therefore, the changes in river bed and surface water elevations would not result in substantial loss of access to locations that provide views of the river, such as boat ramps.

Waverly Segment

Alternative A would result in a 26 percent decrease in both dredging and the number of barges that would be visible on the water in the Waverly segment (see Table 4.4-1 in Section 4.4). Reducing the number of barges on the river would benefit the visual character and quality in these segments. Decreases in dredging would remove some dredging operations from views of the river and river banks. Changes in river bed and surface water elevations would be slight in both the short term and the long term in these segments, and therefore would not result in substantial loss of access to locations along the river that provide views, such as boat ramps.

Alternate Sources

In the short term and the long term, expanded mining and dredging at locations of alternate sources of sand and gravel under Alternative A could convert areas that typically would be vegetated to large, unvegetated swaths of land with piles of sand and gravel and associated mining infrastructure. These features would contrast with the more natural areas that were present prior to construction of new facilities, and would detract from existing views. In addition, dredging operations create noise and movement that would draw viewers' attention to these areas, making them more noticeable.

4.12.5.3 Changes in Light or Glare

St. Joseph Segment

Under Alternative A, the number of barges that would be used and visible on the water would increase; barges have surfaces that reflect light. Because of the reflective nature of the river's surface, an increase in the number of barges of only 7 percent, and the equipment moving and not being stationary, the increased glare from equipment at any given location would not substantially increase existing glare.

Kansas City and St. Charles Segments

Barge trips under Alternative A would decrease by 80 percent in the Kansas City segment and 78 percent in the St. Charles segment (see Table 4.4-1 in Section 4.4), resulting in improved views in the area due to less glare from barges. Sand and gravel stockpiles located onshore would continue to produce light and glare similar to existing conditions. Light and glare associated with operation of the new facilities would increase total light and glare in the area.

Waverly Segment

Under Alternative A, barge trips would decrease by 26 percent in the Waverly segment, resulting in improved views in the area. Sand and gravel stockpiles located onshore would continue to produce light and glare similar to existing conditions.

Jefferson City Segment

Barge trips under Alternative A would decrease by 73 percent (Table 4.4-1 in Section 4.4), resulting in improved views in the area due to less glare from barges. Sand and gravel stockpiles located onshore would continue to produce light and glare similar to existing conditions.

Alternate Sources

In the long term, new facilities could be required for alternate sources of sand and gravel to meet the demand under Alternative A, including along the Mississippi and Kansas Rivers. New facilities would convert areas that typically would be vegetated to large, unvegetated swaths of land with piles of sand and gravel and associated infrastructure. These features would increase the amount of glare by removing vegetative ground covering, exposing lighter subsurface material, and by removing trees and shrubs that absorb light and act as buffers to adjacent land uses. In addition, new structures and lighting have the potential to increase light and glare in the long term.

4.12.6 Alternative B

4.12.6.1 Visual Impacts from New Construction

St. Joseph, Waverly, and Jefferson City Segments

Under Alternative B, no new facilities would be constructed in the St. Joseph, Waverly, or Jefferson City segment. Therefore, no visual impacts from new construction would occur.

Kansas City Segment

Under Alternative B, a new 20 to 60 acre sand plant would be built near RM 388 in the Kansas City segment. Of the two possible site locations, residents would have more immediate views of Plant Site 1. Construction activities at Plant Site 2 would be more readily visible to viewers on the river because construction would occur along the river's edge. Flights leaving from Noah's Ark Airport would view construction activities at either site from the air. Views from River Road would vary based on the presence of roadside vegetation.

Construction activities would create temporary changes in views of and from the source areas for viewers on the river, public roadways, and rural residences, in addition to increasing the presence of trucks on affected local roadways.

The presence of the new facility in the Kansas City segment under Alternative B would result in a permanent change in views in the immediate area from the conversion of land to unvegetated swaths of land and piles of sand and gravel with associated mining infrastructure. These features would contrast sharply with the more natural areas that were present prior to construction of the facility. The new facility would be visible from the river, part of the Lewis and Clark Water Trail that is identified in the SCORP as a trail of statewide importance. A new facility at either location would introduce barges and dredging operations along portions of the river where none presently exist. Truck traffic on local roadways would greatly increase to transport sand and gravel; the increased traffic would negatively affect the views of rural residents located along Waldron and River Roads and roadway users on affected roadways.

St. Charles Segment

The new facility under Alternative B in the St. Charles segment would be visible from the river, which is part of the Lewis and Clark Water Trail, and could be visible from the Katy Trail. Both trails are identified in the SCORP as trails of statewide importance. The new facility would be located in a developed area, in proximity to low-density, suburban residential development; local roadways of Washington; and numerous businesses. Temporary construction-related impacts on visual resources associated with the new facility would include views of equipment on site, cleared land, and trucks on local roads. A new facility at this location would increase barges and dredging operations along portions of the river with ongoing operations nearby at the new Edward N. Rau Contractor Company Washington facility. The new facility and additional barges and tugs would be an addition to area views.

Alternate Sources

Under Alternative B, alternate sources of sand and gravel would be provided by existing facilities and supplies in the short term. Construction of any new facilities needed to support long-term demand would create temporary changes in views of and from the source areas. In general, construction activities would introduce heavy equipment and associated vehicles, including dozers, graders, scrapers, and trucks, into the viewshed from nearby rivers, public roadways, and rural residences. In addition, construction traffic would increase the presence of trucks on affected local roadways.

4.12.6.2 Changes to Scenic Vistas, Scenic Routes, or Existing Visual Character or Quality

St. Joseph Segment

Scenic vistas exist from bridge crossings, roadways along the river, trails, and residences and businesses with expansive views across agricultural fields. Barge trips and dredging amounts would increase by 163 percent under Alternative B, resulting in the addition of barges and dredging activity to nearby scenic vistas (Table 4.4-1 in Section 4.4). Increased dredging would adversely affect the visual quality of viewsheds. Slight river bed degradation would occur in the short term, and slight to moderate river bed degradation would occur in the long term. Low-flow surface water elevations would decrease slightly in the short term and slightly to moderately in the long term. The moderate, long-term changes could result in boat ramps becoming less accessible, which would affect the ability of recreational boaters to access river views.

Kansas City Segment

Scenic vistas are present from bridge crossings, from roadways along the river, and from vantages with expansive views across agricultural fields or similar conditions. A 54 percent decrease in dredging and in the number of barges that would be visible on the water would occur in the Kansas City segment (Table 4.4-1 in Section 4.4) under Alternative B. Reducing the number of barges on the river would benefit the visual character and quality of this segment of the LOMR. Decreases in dredging would remove some dredging operations from views of the river and river banks. In the short term, slight river bed degradation and slight decreases in low-flow water surface elevations would occur. In the long term, moderate river bed degradation and slight to moderate decreases in low-flow water surface elevations would occur. These effects could result in boat ramps becoming less accessible, which would affect the ability of recreational boaters to access river views. All viewer groups would be affected by this adverse, potential loss of views.

Waverly Segment

Scenic vistas exist from bridge crossings, roadways along the river, trails, and residences and businesses with expansive views across agricultural fields. Barge trips and dredging would increase by 68 percent, resulting in the addition of barges and dredging activity to nearby scenic vistas (Table 4.4-1 in Section 4.4) under Alternative B. Increased dredging would adversely affect the visual quality of viewsheds. Slight aggradation or river bed degradation would occur in the short term, and slight river bed degradation would occur in the long term. Low-flow surface water elevations would increase or decrease slightly in the short term and slightly decrease in the long term. These slight changes likely would not result in substantial changes in accessing views from boat ramps and other viewing locations along the river.

Jefferson City Segment

Scenic vistas are present from bridge crossings, from roadways along the river, and from vantages with expansive views across agricultural fields or similar conditions. A 38-percent decrease in dredging and in the number of barges that would be visible on the water would occur in the Jefferson City segment under Alternative B (Table 4.4-1 in Section 4.4). Reducing the number of barges on the river would benefit the visual character and quality of this segment of the LOMR. In the short term, slight river bed degradation would occur. In the long term, slight to moderate river bed degradation and slight decreases in low-flow water surface elevations would occur. The moderate long-term river bed degradation could result in boat ramps becoming less accessible, which would affect the ability of recreational boaters to access river views. All viewer groups would be affected by this adverse, potential loss of views.

St. Charles Segment

Scenic vistas are present from bridge crossings, from roadways along the river, and from vantages with expansive views across agricultural fields or similar conditions. A 49 percent decrease in the number of barges that would be visible on the water would occur in the St. Charles segment under Alternative B (see Table 4.4-1 in Section 4.4). Reducing the number of barges on the river would benefit the visual character and quality of this segment of the LOMR. In the short term, slight river bed degradation would occur. In the long term, slight to moderate river bed degradation and slight to moderate decreases in low-flow water surface elevations would occur. The moderate geomorphic changes could result in boat ramps becoming less accessible, which would affect the ability of recreational boaters to access river views. All viewer groups would be affected by this adverse, potential loss of views.

Alternate Sources

In the short term and the long term, expanded mining and dredging at locations of alternate sources of sand and gravel under Alternative B could convert areas that typically would be vegetated to large, unvegetated swaths of land with piles of sand and gravel and associated mining infrastructure. These features would contrast with the more natural areas that were present prior to construction of new facilities and would detract from existing views. In addition, dredging operations create noise and movement that would draw viewers' attention to these areas, making them more noticeable.

4.12.6.3 Changes in Light or Glare

St. Joseph Segment

Under Alternative B, the number of barges that would be used and visible in the St. Joseph segment would increase by 163 percent. Barges have surfaces that reflect light. Due to the reflective nature of the river's surface and because equipment would be moving and not stationary, the increased glare from equipment at any given location would not substantially increase glare. Sand and gravel stockpiles, which produce glare, would remain onshore.

Kansas City and St. Charles Segments

Under Alternative B, barge trips would decrease by 54 percent in the Kansas City segment and 38 percent in the St. Charles segment (see Table 4.4-1 in Section 4.4), resulting in improved views in the area due to less glare. Sand and gravel stockpiles located onshore would continue to produce light and glare similar to existing conditions. Light and glare associated with operation of the new facilities would increase total light and glare in the area. Nighttime lighting would be minimal at the new facilities and would not adversely affect viewer groups. However, the new facilities would convert areas that typically would be vegetated to a large, unvegetated swath of land and piles of sand and gravel with associated infrastructure. These features would increase the amount of glare in each of these segments by removing vegetative ground covering, exposing lighter subsurface material, and by removing trees and shrubs that absorb light and act as buffers to adjacent land uses.

Waverly Segment

Under Alternative B, barge trips would increase by 68 percent in the Waverly segment. The increased number of barges on the river would increase glare produced by equipment on the river. Due to the reflective nature of the river's surface and because equipment would be moving and not stationary, the

incremental increase in glare related to the additional barges would not substantially increase total glare in the segment.

Jefferson City Segment

Under Alternative B, barge trips would decrease by 38 percent in the Jefferson City segment (see Table 4.4-1 in Section 4.4), resulting in improved views in the area due to less glare. Sand and gravel stockpiles located onshore would continue to produce light and glare similar to existing conditions.

Alternate Sources

Under Alternative B, new facilities could be required for alternate sources of sand and gravel to meet the long-term demand, including along the Mississippi and Kansas Rivers. New facilities would convert areas that typically would be vegetated to large, unvegetated swaths of land with piles of sand and gravel and associated infrastructure. These features would increase the amount of glare by removing vegetative ground covering, exposing lighter subsurface material, and by removing trees and shrubs that absorb light and act as buffers to adjacent land uses. In addition, structures and site lighting have the potential to increase light and glare.

4.12.7 Alternative C

4.12.7.1 Visual Impacts from New Construction

St. Joseph, Waverly, and Jefferson City Segments

Under Alternative C, no new facilities would be constructed in the St. Joseph, Waverly, or Jefferson City segment. Therefore, no visual impacts from new construction would occur.

Kansas City Segment

Under Alternative C, a new 20 to 60 acre sand plant would be built near RM 388 in the Kansas City segment. Of the two possible plant locations, residents would have more immediate views of Plant Site 1. Construction activities at Plant Site 2 would be more readily visible to viewers on the river because construction would occur along the river's edge. Flights leaving from Noah's Ark Airport would view construction activities at either site from the air. Views from River Road would vary based on the presence of roadside vegetation.

Construction activities under Alternative C would create temporary changes in views of and from the source areas for viewers on the river, public roadways, and rural residences, in addition to increasing the presence of trucks on affected local roadways.

The presence of the new facility under Alternative C would result in a permanent change in views in the immediate area because of conversion of land to unvegetated swaths of land and piles of sand and gravel with associated mining infrastructure. These features would contrast sharply with the more natural areas that were present prior to construction of the facility. The new facility would be visible from the river, part of the Lewis and Clark Water Trail that is identified in the SCORP as a trail of statewide importance. A new facility at either location would introduce barges and dredging operations along portions of the river where none presently exist. Truck traffic on local roadways would greatly increase to transport sand and gravel; the increased traffic would negatively affect the views of rural residents located along Waldron and River Roads and roadway users on affected roadways.

St. Charles Segment

Under Alternative C, the new facility would be visible from the river, which is part of the Lewis and Clark Water Trail, and could be visible from the Katy Trail. Both trails are identified in the SCORP as trails of statewide importance. The new facility would be located in a developed area, in proximity to low-density, suburban residential development; local roadways of Washington; and numerous businesses. Temporary construction-related impacts on visual resources associated with the new facility would include views of equipment on site, cleared land, and trucks on local roads. A new facility at this location would increase barges and dredging operations along portions of the river, with ongoing operations nearby at the new Edward N. Rau Contractor Company Washington facility. The new facility and additional barges and tugs would be an addition to area views.

Alternate Sources

No new construction is expected in the short term or the long-term at locations of alternate sources of sand and gravel because current dredging would continue on the LOMR to meet regional demand.

4.12.7.2 Changes to Scenic Vistas, Scenic Routes, or Existing Visual Character or Quality

St. Joseph Segment

Under Alternative C, dredging amounts and barge trips would increase by less than 1 percent in the St. Joseph segment, resulting in negligible changes to scenic or visual resources. In the short term, slight changes in river bed elevations would occur; in the long term, slight changes to both river bed and low-

flow surface water elevations would occur. These slight changes likely would not result in substantial changes in accessing views from boat ramps, other viewing points along the river, or boats on the river.

Kansas City Segment

Under Alternative C, dredging amounts and barge trips would not change in the Kansas City segment, resulting in no changes to scenic or visual resources. In the short term, slight to moderate river bed degradation would occur along with slight to moderate decreases in low-flow surface water elevations. In the long term, substantial river bed degradation and moderate to substantial decreases in low-flow surface water elevations would occur. Moderate to substantial changes in river bed and low-flow water surface elevations could result in boat ramps becoming less accessible, which would affect the ability of recreational boaters to access river views.

Waverly Segment

Under Alternative C, dredging amounts and barge trips would not change in the Waverly segment, resulting in no changes to scenic or visual resources. In the short term and long term, slight changes in river bed elevations would occur. No change in low-flow surface water elevations is expected in the short term or long term. The slight river bed elevation changes likely would not result in substantial changes in accessing views from boat ramps, other viewing points along the river, or boats on the river.

Jefferson City Segment

Under Alternative C, dredging amounts and barge trips would not change in the Jefferson City segment, resulting in no changes to scenic or visual resources. In the short term, slight river bed degradation would occur along with slight decreases in low-flow surface water elevations. In the long term, moderate to substantial river bed degradation and moderate to substantial decreases in low-flow surface water elevations would occur. Moderate to substantial changes in river bed and low-flow water surface elevations could result in boat ramps becoming less accessible, which would affect the ability of recreational boaters to access river views.

St. Charles Segment

Under Alternative C, barge trips would not change in the St. Charles segment, resulting in no changes to scenic or visual resources. In the short term, slight river bed degradation would occur along with slight decreases in low-flow surface water elevations. In the long term, moderate to substantial river bed degradation and slight to moderate decreases in low-flow surface water elevations would occur. Moderate to substantial changes in river bed and low-flow water surface elevations could result in boat

ramps becoming less accessible, which would affect the ability of recreational boaters to access river views.

Alternate Sources

No new construction is expected in the short term or the long-term at locations of alternate sources of sand and gravel because current dredging would continue on the LOMR to meet regional demand.

4.12.7.3 Changes in Light or Glare

St. Joseph, Waverly, and Jefferson City Segments

Barge trips would increase by 0–1 percent in the St. Joseph, Waverly, and Jefferson City segments under Alternative C, resulting in no adverse glare-related visual change in the Project area. Views would remain similar to existing conditions. Views may change in the future, consistent with future trends and continuing changes to river bed elevations and water surface elevations. Sand and gravel stockpiles, which produce glare, would remain onshore.

Kansas City and St. Charles Segments

Under Alternative B, the number of barge trips would not change in the Kansas City or St. Charles segment. Light and glare associated with operation of the new sand plants (one facility in each of these segments) would increase total light and glare in the area.

Alternate Sources

In the long term, new facilities could be required for alternate sources of sand and gravel to meet the demand under Alternative C, including along the Mississippi and Kansas Rivers. New facilities would convert areas that typically would be vegetated to large, unvegetated swaths of land with piles of sand and gravel and associated infrastructure. These features would increase the amount of glare by removing vegetative ground covering, by exposing lighter subsurface material, and by removing trees and shrubs that absorb light and act as buffers to adjacent land uses. In addition, new structures and lighting have the potential to increase light and glare in the long term.

4.12.8 Summary of Impacts

Table 4.12-1 presents a summary of potential impacts on visual and aesthetic resources for the Proposed Action and alternatives.

Table 4.12-1 Summary of Potential Impacts on Visual and Aesthetic Resources

Category of Impact	Proposed Action	No Action Alternative	Alternative A	Alternative B	Alternative C
Visual impacts from new construction	<ul style="list-style-type: none"> Visual changes from construction activity in the short term; direct long-term changes in views from presence of new facilities in the Kansas City and St. Charles segments. 	<ul style="list-style-type: none"> Short-term views of trucks and construction equipment and long-term views of new plants at alternate sources. 	<ul style="list-style-type: none"> Visual changes from construction activity in the short term; direct long-term changes in views from presence of new facilities in the Kansas City and St. Charles segments. Short-term views of trucks and construction equipment and long-term views of new plants at alternate sources. 	<ul style="list-style-type: none"> Visual changes from construction activity in the short term; direct long-term changes in views from presence of new facilities in the Kansas City and St. Charles segments. Short-term views of trucks and construction equipment and long-term views of new plants at alternate sources. 	<ul style="list-style-type: none"> Visual changes from construction activity in the short term; direct long-term changes in views from presence of new facilities in the Kansas City and St. Charles segments.
Changes to scenic vistas, scenic routes, or visual character or quality	<ul style="list-style-type: none"> Direct short-term and long-term change from increase in barges and tugs on river; potential indirect long-term reduced visual access if boat ramps were inaccessible; effect of barges most pronounced in St. Joseph and St. Charles segments. 	<ul style="list-style-type: none"> Improvement in views from fewer industrial activities, barges, and dredges; introduction into viewshed of possible vacant sites and abandoned equipment. Potential change to scenic resources near alternate sources. 	<ul style="list-style-type: none"> Direct short-term change from slight increase of barges and tugs in St. Joseph segment; potential indirect long-term reduced visual access if boat ramps were inaccessible; addition to views of two new plants (Kansas City and St. Charles segments). Potential change to scenic resources near alternate sources. 	<ul style="list-style-type: none"> Direct short-term change from visible increase of barges and tugs in St. Joseph and Waverly segments; potential indirect long-term reduced visual access if boat ramps were inaccessible; addition to views of two new plants (Kansas City and St. Charles segments). Potential change to scenic resources near alternate sources. 	<ul style="list-style-type: none"> Potential indirect long-term reduced visual access if boat ramps were inaccessible; addition to views of two new plants (Kansas City and St. Charles segments).

Table 4.12-1 Summary of Potential Impacts on Visual and Aesthetic Resources

Category of Impact	Proposed Action	No Action Alternative	Alternative A	Alternative B	Alternative C
Changes in light or glare	<ul style="list-style-type: none"> Direct long-term increase in light and glare from more barges on the LOMR, most pronounced for St. Joseph and St. Charles segments; direct long-term increase in light and glare from removal of vegetation and operation of new facilities in Kansas City and St. Charles segments. 	<ul style="list-style-type: none"> Less light and glare from reduction in number of barges and dredges on river and restoration of onshore facility sites. Long-term increases in light and glare from new alternate source facilities. 	<ul style="list-style-type: none"> Direct long-term increase in light and glare from more barges on the LOMR, only for St. Joseph segment; direct long-term increase in light and glare from removal of vegetation and operation of new facilities in Kansas City and St. Charles segments. Long-term increases in light and glare from new alternate source facilities. 	<ul style="list-style-type: none"> Direct long-term increase in light and glare from more barges on the LOMR, only for St. Joseph and Waverly segments; direct long-term increase in light and glare from removal of vegetation and operation of new facilities in Kansas City and St. Charles segments. Long-term increases in light and glare from new alternate source facilities. 	<ul style="list-style-type: none"> Direct long-term increase in light and glare from removal of vegetation and operation of new facilities in Kansas City and St. Charles segments.

Note: LOMR = Lower Missouri River.

4.12.9 References

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