Appendix E

Analysis of Federal Endangered, Threatened, and Candidate Species

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This appendix is intended to provide additional clarification to the tables in Chapter 4. The potential impacts of proposed system alternatives to Federal Endangered, Threatened, and Candidate species at the county level and the likelihood of occurrence are identified below.

Birds

Least Tern (Potentially in SA-03, SA-04, SA-05, SA-06, SA-07, SA-08, and SA-Applicant)

The least tern is associated with large river systems such as, the Missouri and Mississippi Rivers. Impacts to the least tern can be avoided by timing pipeline construction and placement through preferred large river shoreline habitats outside of the spring breeding season. Additionally, minimization of project impacts to large river systems utilized by the species for foraging can be accomplished by directionally boring the pipeline under the river channel.

Direct lethal take of the species during project construction or operation is unlikely with any of the system alternatives.

Piping Plover – Great Plains Population (Potentially in SA-03, SA-04, SA-05, SA-07, SA-08, and SA-Applicant)

Individuals of the Great Plains population of piping plover nest along the sandy shorelines of alkali wetlands, lakes, and larger rivers in North Dakota and South Dakota. Piping plovers may also nest on sandbar formations in larger river systems, specifically the Missouri River.

Additionally, individuals in the Great Plains population of piping plover migrate through North Dakota and South Dakota during spring and fall migration. Migrating birds may be temporarily displaced if foraging and resting habitats are disturbed during the construction and vegetation maintenance phases of the proposed project. Lethal take of the migrating individuals is unlikely as they will naturally move away from the construction area to alternate resting and foraging locations.

Nesting adults and flightless young birds could be at risk of lethal take if construction or vegetative maintenance activities are conducted during the spring near sandy shorelines or sandbars. During active nesting and rearing of young birds any ground or vegetative disturbance near piping plover nesting and rearing areas would likely result in nest abandonment and/or lost fitness of the adult and young birds which ultimately result in lost reproductive success and recruitment of young into the population.

All proposed system alternatives contain one designated Critical Habitat for the Great Plain's population of the piping plover in North Dakota.

Piping Plover – Great Lakes Population (Potentially in SA-03, SA-06, SA-07, and SA-Applicant)

Individuals of the Great Lakes population of the piping plover have utilized sandy beaches along Lake Superior in the Duluth, Minnesota and Superior, Wisconsin area for nesting and stopover habitat. The proposed system alternatives extending through Douglas County, Wisconsin terminating at the Superior Harbor bisect forest habitat and developed harbor terminal areas, which are not preferred habitat of the piping plover. The lethal take or disturbance of any individuals of the Great Lakes population of the piping plover by any of the proposed system alternatives is unlikely.

Red Knot (Potentially in SA-03, SA-04, SA-05, SA-06, SA-07, SA-08, and SA-Applicant)

The red knot is currently only thought to migrate through the states of North and South Dakota on its northbound spring migration flight. Potential impacts to the species would likely be limited to temporary displacement from migratory stop over habitat. Individuals flying through North and South Dakota at the time of project construction could be forced to fly to alternative stop over habitats to feed and rest during the construction and vegetation maintenance phases of the proposed project. Direct lethal take of the species during project construction or operation is unlikely with all system alternatives.

Sprague's Pipit (Potentially in SA-03, SA-04, SA-05, SA-06, SA-07, SA-08, and SA-Applicant)

Avoidance of project construction and placement in large tracts of grassland, larger than 350 acres, during the spring and summer seasons will reduce ground disturbance when the Sprague's pipit is nesting and rearing young. Construction within large grassland tracts could result in the lethal take or displacement of both adults and young of the species. Ground disturbance caused by construction may also result in the introduction of non-native and invasive plant species, which can disrupt the plant communities preferred by the species. All system alternatives could cause impacts to the Sprague's pipit or the species' habitat. Additional analysis and planning will be necessary to ensure that potential impacts are avoided or minimized when the final systems are selected to move forward in the process.

Whooping Crane – Endangered (Potentially in SA-03, SA-04, SA-05, SA-06, SA-07, SA-08, and SA-Applicant)

Individuals in the North Dakota population may only be migrating through the project area in the spring and fall, and some individuals will be nesting within the wet meadows of the prairie pothole region in the spring months. Project construction and placement through wet meadow and grassland habitats could result in displacement of nesting individuals and migratory individuals. Project construction through nesting habitat in the spring could potentially result in the destruction of nests, eggs, and/or the lethal take of young birds.

Construction timing and location could be targeted to avoid wetland and grassland habitats preferred by the species during spring nesting and summer, and it is anticipated that individuals will move away from construction activities. All system alternatives could cause impacts to the whooping crane or the species' habitat. Additional analysis and planning will be necessary to ensure that potential impacts are avoided or minimized when the final systems are selected to move forward in the process.

Whooping Crane – Non-essential Experimental Population

Whooping cranes found in Minnesota are part of a Non-essential, Experimental Population, and have not been shown to currently nest in Minnesota. These individuals currently appear to be taking exploratory flights into Minnesota, and have occasional stopover locations at wetlands, grasslands, and hayfield habitats. Individuals within this population are not afforded protection from take under the Endangered Species Act (ESA) for otherwise legal activities, such as the construction and operation of a pipeline. There is potential to displace individuals from this experimental population should they be utilizing habitat along the project during construction, but at this time the individuals have not developed predictable patterns of habitat use throughout Minnesota.

Construction timing and location could be targeted to avoid wetland and grassland habitats preferred by the species during spring and summer, and it is anticipated that individuals will move away from construction activities. The non-essential experimental population of whooping cranes are not given full protection under ESA, and with respect to the proposed project, as long as the project proponent is conducting legal activities and has secured all necessary permit, the accidental, non-intentional take of an individual from the experimental population would not be a violation of the ESA.

Mussels

Higgins eye Pearlymussel (Potentially in SA-03, SA-04, SA-05, SA-06, SA-07, and SA-08)

Higgins eye pearlymussel distribution is primarily located in the Mississippi and St. Croix Rivers. The species prefers areas with moderate depth and with moderate current flow. The proposed SA-03 project alternative is not anticipated to directly impact the Higgins eye pearlymussel as pipeline construction and placement can be completed outside of the Mississippi and St. Croix Rivers where the species currently exists. Indirect project impacts to the Higgins eye pearlymussel can also be avoided with SA-03 by employing appropriate Best Management Practices (BMPs) to reduce soil disturbance and soil erosion during construction that is in close proximity to preferred habitat of the species in the St. Croix River.

SA-04 and SA-05 will cross the Mississippi River at the Iowa/Illinois state border as they enter Rock Island County, Illinois. Both alternatives will require directional boring under the Mississippi River, and associated backwaters to place the proposed pipeline and avoid potential impacts to the local mussel populations. Additionally, appropriate BMPs will be put in place to reduce soil disturbance and minimize soil erosion into the Mississippi River.

SA-06 and SA-07 will cross the Mississippi River at the Dakota/Washington County boundary, which is identified as being within the Higgins eye pearlymussel known range. Both alternatives will require directional boring under the Mississippi River, and associated backwaters to place the proposed pipeline and avoid potential impacts to the local mussel populations. Additionally, appropriate BMPs will be put in place to reduce soil disturbance and minimize soil erosion into the Mississippi River as well as the St. Croix River as SA-06 and SA-07 head north through Washington and Chisago Counties.

SA-08 as proposed will cross the Mississippi River in two location within Higgins eye pearlymussel know range; along the Hennepin/Anoka County boundary, and the Washington/Dakota County boundary. Directional boring under the Mississippi River, and associated backwaters, will be necessary to place the proposed pipeline and avoid potential impacts to the local mussel populations. Additionally, appropriate BMPs will be put in place to reduce soil disturbance and minimize soil erosion.

Snuffbox Mussel (Potentially in SA-03, SA-06, SA-07, and SA-08)

The snuffbox mussel typically inhabits small to medium sized creeks and streams with fast currents, and has occasionally been found in Lake Erie and large rivers. Clean, deep, sand and gravel substrates are necessary for the species. The primary threats to the snuffbox mussel are habitat connectivity restrictions by dams, increased sedimentation, and poor water quality. The proposed project should be able to avoid impacts to the species by completing pipeline placement by directionally boring under inhabited streams and rivers, and by implementing appropriate BMPs to provide soil erosion control, sedimentation into inhabited water courses will be minimized. Lethal take and negative impacts to the snuffbox mussel habitat is unlikely to occur from the proposed project.

The proposed SA-03 project alternative is not anticipated to directly impact the snuffbox mussel as pipeline construction and placement can be completed outside of the Mississippi and St. Croix Rivers where the species currently exists. Indirect project impacts to the snuffbox mussel can also be avoided with SA-03 by employing appropriate BMPs to reduce soil disturbance and soil erosion during construction that is in close proximity to preferred habitat of the species in the St. Croix River.

SA-06 and SA-07 will cross the Mississippi River at the Dakota/Washington County boundary, which is identified as being within the snuffbox mussel known range. Both alternatives will require directional boring under the Mississippi River, and associated backwaters to place the proposed pipeline and avoid potential impacts to the local mussel populations. Additionally, appropriate BMPs will be put in place to reduce soil disturbance and minimize soil erosion into the Mississippi River as well as the St. Croix River as SA-06 and SA-07 head north through Washington and Chisago Counties.

SA-08 as proposed will cross the Mississippi River in two location within the snuffbox mussels know range; along the Hennepin/Anoka County boundary, and the Washington/Dakota County boundary. Directional boring under the Mississippi River, and associated backwaters, will be necessary to place the proposed pipeline and avoid potential impacts to the local mussel populations. Additionally, appropriate BMPs will be put in place to reduce soil disturbance and minimize soil erosion.

Spectacleccase (Potentially in SA-03, SA-04, SA-05, SA-06, SA-07, and SA-08)

Spectaclecase mussels are found in areas out of the main flow in large rivers, and the species prefers areas with firm mud substrates with overhead protection such as rock ledges, boulders, or tree roots. Primary threats to the spectaclecase mussel are habitat connectivity restrictions by dams, increased sedimentation, and poor water quality. The proposed project will be able to avoid impacts to the species by completing pipeline placement by directionally boring under inhabited rivers, and by

implementing appropriate BMPs to provide soil erosion control, sedimentation into inhabited water courses will be minimized. Lethal take of individual mussels and negative impacts to the spectaclecase mussel habitat is unlikely to occur from the proposed project.

The proposed SA-03 project alternative is not anticipated to directly impact the spectaclecase mussel as pipeline construction and placement can be completed outside of the Mississippi and St. Croix Rivers where the species currently exists. Indirect project impacts to the spectaclecase mussel can also be avoided with SA-03 by employing appropriate BMPs to reduce soil disturbance and soil erosion during construction that is in close proximity to preferred habitat of the species in the St. Croix River.

SA-04 and SA-05 will cross the Mississippi River at the Iowa/Illinois state border as they enter Rock Island County, Illinois. Both alternatives will require directional boring under the Mississippi River, and associated backwaters to place the proposed pipeline and avoid potential impacts to the local mussel populations. Additionally, appropriate BMPs will be put in place to reduce soil disturbance and minimize soil erosion into the Mississippi River.

SA-06 and SA-07 will cross the Mississippi River at the Dakota/Washington County boundary, which is identified as being within the spectaclecase mussel known range. Both alternatives will require directional boring under the Mississippi River, and associated backwaters to place the proposed pipeline and avoid potential impacts to the local mussel populations. Additionally, appropriate BMPs will be put in place to reduce soil disturbance and minimize soil erosion into the Mississippi River as well as the St. Croix River as SA-06 and SA-07 head north through Washington and Chisago Counties.

SA-08 as proposed will cross the Mississippi River in two locations, one of those locations is within spectaclecase mussel know range; along the Washington/Dakota County boundary. Directional boring under the Mississippi River, and associated backwaters, will be necessary to place the proposed pipeline and avoid potential impacts to the local mussel populations. Additionally, appropriate BMPs will be put in place to reduce soil disturbance and minimize soil erosion.

Winged Mapleleaf (Potentially in SA-03, SA-06, SA-07, and SA-08)

Winged mapleleaf mussels are found in riffles with sand, gravel, or rubble bottoms. There are currently only five known isolated populations of winged mapleleaf mussels in the United States. One of the five known populations of the species is located in the St. Croix River on the Minnesota – Wisconsin border. Primary threats to the winged mapleleaf mussel are habitat connectivity restrictions by dams, increased sedimentation, and poor water quality. The proposed project will be able to avoid impacts to the species by completing pipeline placement that will not cross the St. Croix River. Additionally, implementing appropriate BMPs to provide soil erosion controls for activities that will be completed within the St. Croix River watershed. Lethal take and negative impacts to the winged mapleleaf mussel habitat is unlikely to occur from the proposed project.

The proposed SA-03 project alternative is not anticipated to directly impact the winged mapleleaf mussel as pipeline construction and placement can be completed outside of the Mississippi and St. Croix

Rivers where the species currently exists. Indirect project impacts to the spectaclecase mussel can also be avoided with SA-03 by employing appropriate BMPs to reduce soil disturbance and soil erosion during construction that is in close proximity to preferred habitat of the species in the St. Croix River.

SA-06 and SA-07 will cross the Mississippi River at the Dakota/Washington County boundary, which is identified as being within the winged mapleleaf mussel known range. Both alternatives will require directional boring under the Mississippi River, and associated backwaters to place the proposed pipeline and avoid potential impacts to the local mussel populations. Additionally, appropriate BMPs will be put in place to reduce soil disturbance and minimize soil erosion into the Mississippi River as well as the St. Croix River as SA-06 and SA-07 head north through Washington and Chisago Counties.

SA-08 as proposed will cross the Mississippi River in two location, one of those locations is within winged mapleleaf mussel know range; along the Washington/Dakota County boundary. Directional boring under the Mississippi River, and associated backwaters, will be necessary to place the proposed pipeline and avoid potential impacts to the local mussel populations. Additionally, appropriate BMPs will be put in place to reduce soil disturbance and minimize soil erosion.

Sheepnose (Potentially in SA-04, SA-05, SA-06, SA-07, and SA-08)

Sheepnose mussels prefer shallow areas in large rivers with moderate to fast current, with coarse sand or gravel substrates. Individuals have also been found in deep river runs, and areas with mud, cobble, and boulder substrates. Primary threats to the sheepnose mussel are habitat connectivity restriction by dams, increased sedimentation, and poor water quality. The proposed project will be able to avoid impacts to the species by completing pipeline placement by directionally boring under inhabited rivers, and by implementing appropriate BMPs to provide soil erosion control, sedimentation into inhabited water courses will be minimized. Lethal take and negative impacts to the sheepnose mussel habitat is unlikely to occur from the proposed project.

SA-04 and SA-05 will cross the Mississippi River at the Iowa/Illinois state border as they enter Rock Island County, Illinois. Both alternatives will require directional boring under the Mississippi River, and associated backwaters to place the proposed pipeline and avoid potential impacts to the local mussel populations. Additionally, appropriate BMPs will be put in place to reduce soil disturbance and minimize soil erosion into the Mississippi River.

SA-06 and SA-07 will not cross the St. Croix River but, appropriate BMPs will be put in place to reduce soil disturbance and minimize soil erosion into the St. Croix River and it's tributaries as SA-06 and SA-07 head north through Washington County.

SA-08 as proposed will enter into Washington County, Minnesota, which is identified as a county within the range of the sheepnose mussel. However, the populations of sheepnose mussel known to occur in Washington County are located within the St. Croix River, and are currently not known to be present in this reach of the Mississippi River. As proposed SA-08 is not anticipated to directly or indirectly impact the sheepnose mussel.

Fish

Pallid Sturgeon (Potentially in SA-03, SA-04, SA-05, SA-06, SA-07, SA-08, and SA-Applicant)

Pallid sturgeons are found exclusively within large river systems, such as the Missouri and Mississippi Rivers. Lethal take of the pallid sturgeon by any of the proposed system alternatives is unlikely as no work within the larger river channels is anticipated during the construction, operation, or regular maintenance of the proposed project.

Implementation of BMPs to control soil erosion into the larger rivers and their tributaries, and directional boring of any pipeline segments that must cross a large river will avoid direct and indirect impacts to the species.

If project construction is anticipated to result in disturbance to the channel of rivers inhabited by the pallid sturgeon additional analysis will be necessary to determine the potential impacts to the species.

Topeka Shiner (Potentially in SA-05)

Topeka shiners are found in small prairie streams with off-channel pool and oxbow habitat areas. The species utilizes low or no flow pool habitats adjacent to the main channel of the stream for spawning and foraging. The proposed project will be able to avoid direct impacts to the species by boring under prairie streams and adjacent wetlands for pipeline placement, and by minimizing indirect impacts by minimizing erosion through BMPs in the areas adjacent to the streams and wetlands.

SA-05 crosses Lincoln and Murray Counties in Minnesota, which both counties have occurrence records of the Topeka shiner as well as designated Critical Habitat for the species. However, as proposed SA-05 does not cross any of the designated Critical Habitat stream segments for the species. Lethal take and disturbance of the Topeka shiner is unlikely with SA-05 as long as prairie stream and adjacent wetland impacts are avoided during construction and maintenance activities.

Insects

Dakota Skipper (Potentially in SA-03, SA-04, SA-05, SA-06, SA-07, SA-08, and SA-Applicant)

Dakota skipper prefer short to mid height native prairie, but the species will utilize grasslands with a mixture of native and non-native species as long as the appropriate native grasses and forbs are present for larval foraging and adult nectar feeding, respectively. Potential impacts to the species from the proposed project would result from ground disturbance during pipeline construction and vegetative maintenance during operation. Any activities resulting in ground disturbance to grasslands inhabited by the Dakota skipper could potentially result in the lethal take of the larval stage of the species. Additionally, the adult individuals could be disturbed during pipeline construction or vegetative maintenance, and disturbance could result in reduced feeding, reduced egg laying, or the additional expenditure of energy which will result in reduced overall fitness.

SA-03 contains one occupied, proposed Critical Habitat unit for the Dakota skipper in Minnesota. SA-04 contains one occupied, proposed Critical Habitat unit for the Dakota skipper in North Dakota. SA-05 contains three proposed Critical Habitat units for the Dakota skipper, one occupied in North Dakota, one unoccupied in North Dakota, and one occupied in South Dakota. Regardless of the system alternative selected additional analysis will need to be completed to determine a project route that will avoid impacts to the Dakota skipper.

Hine's Emerald Dragonfly (Potentially in SA-04 and SA-05)

Hine's emerald dragonfly are found in spring fed wet meadows and marshes. Any soil surface disturbance or boring activity that may impact groundwater flow and hydrology will negatively impact the species habitat, and potentially impact individuals of the species at all stages of life. The wetland types inhabited by Hine's emerald dragonfly are highly sensitive to disturbance, and very rare in nature. Project placement within spring fed wetlands utilized by the species, or in adjacent upland habitats will impact the species.

Should SA-04 or SA-05 alternatives move forward additional analysis will be necessary to identify pipeline routes that will avoid impacting the Hine's emerald dragonfly. The terminus of SA-04 and SA-05 are located in Will County, Illinois, and within the De Plaines River watershed, which is the only known occurrence in Will County, Illinois.

Poweshiek Skipperling (Potentially in SA-04, SA-05, SA-06, SA-07, and SA-08)

Poweshiek skipperling is a butterfly species found in high quality native prairie habitat. Soil surface disturbance during pipeline construction and vegetation maintenance during project operation will impact the species if the activities occur in grasslands inhabited by the species. Lethal take of larval individuals can occur through ground disturbance and vegetative removal, and adult individuals will be disturbed by ground disturbance and the removal of nectar plant species. Avoidance of project placement within inhabited grasslands will avoid impacts to the species.

If SA-04, SA-05, SA-06, SA-07 or SA-08 alternatives move forward additional analysis will be necessary to determine a route that will avoid impacts to the Poweshiek skipperling.

Rattlesnake-master Borer Moth (Potentially in SA-04 and SA-05)

Rattlesnake-master borer moths prefer undisturbed prairie and openings in woodlands where rattlesnake-master plant population are established and adequate to provide food for all life stages of the species. Ground disturbance and vegetative clearing activities which impact rattlesnake-master plants could impact the species.

Should SA-04 or SA-05 alternatives move forward additional analysis will be necessary to identify pipeline routes that will avoid impacting the rattlesnake-master borer moth.

<u>Mammals</u>

Canada Lynx (Potentially in SA-03, SA-06, SA-07, and SA-Applicant)

Canada lynx occupy boreal forest habitat, which receive significant snow fall and have adequate snowshoe hare populations. Ground disturbance and vegetation clearing for maintenance activities would likely have a temporary impact on adult and young individuals. The impact would primarily be in the form of disturbance, which would result in the affected individuals moving away from the noise created by equipment. The proposed project should result in no lethal take of Canada lynx individuals, and the disturbance of individuals will be temporary in nature. The pipeline route and maintained corridor will likely not create a barrier to lynx movement as it will have limited human access and will not be regularly traveled by vehicles. The adult lynx may utilize the route as a hunting corridor as the clearing of vegetation may attract their primary prey species, the snowshoe hair.

Northern Long-eared Bat (Potentially in SA-03, SA-04, SA-05, SA-06, SA-07, SA-8, and SA-Applicant)

Northern long-eared bats utilize caves and mine shafts for winter hibernacula, and summer roosting and foraging habitats typically consist of mixed forest stands with a preference for forested areas in close proximity to wetlands, streams, or rivers when available. Prior to entering the hibernacula for the winter northern long-eared bats will swarm near the cave or mine entrance, and woodland areas in close proximity to hibernacula are important habitat for swarming bats. Impacts to hibernating northern long-eared bats are unlikely as any selected project route would avoid disturbance to caves and old mine shafts. Drilling, boring, blasting, and other loud activities, 75 decibels or greater on the A scale, conducted during project construction and maintenance will be avoided within one mile of hibernacula occupied by northern long-eared bats. All subsurface activities associated with the proposed project will be conducted in a manner that will not impact the structure or environmental conditions needed in a hibernacula used by the northern long-eared bat.

Summer roosting northern long-eared bats could be impacted if occupied roost trees are cut down during construction or vegetative maintenance activities during operation. Direct lethal take of roosting individuals can be avoided in all system alternatives by completing tree clearing activities between December and March when the northern long-eared bats are in their hibernacula.

The proposed project may cause impacts to the species by removing summer roost habitat and fall swarming habitat. Minimizing the amount of tree removal within 50 miles of known hibernacula will minimize the loss of potential summer roost habitat and fall swarming areas for the species. All system alternatives have the potential to affect the northern long-eared bat, and additional analysis and planning efforts will be necessary to avoid and minimize impacts to the species and the species habitat as selected alternatives move forward.

Indiana Bat (Potentially in SA-04 and SA-05)

Indiana bats utilize caves and mine shafts for winter hibernacula, and summer roosting and foraging habitats typically consist of forested riparian areas and upland forests. As adult bats emerge from the hibernacula in the spring they will stage for a brief period in nearby forested areas, and prior to entering

the hibernacula for the winter Indiana bats will swarm near the cave or mine entrance in woodland areas. Impacts to hibernating Indiana bats are unlikely as any selected project route would avoid disturbance to caves and old mine shafts. Drilling, boring, blasting, and other loud activities, 75 decibels or greater on the A scale, conducted during project construction and maintenance will be avoided within one mile of hibernacula occupied by Indiana bats. All subsurface activities associated with the proposed project will be conducted in a manner that will not impact the structure or environmental conditions needed in a hibernacula used by the Indiana bat.

Summer roosting Indiana bats could be impacted if occupied roost trees are cut down during construction or vegetative maintenance activities during operation. Direct lethal take of roosting individuals can be avoided in all system alternatives by completing tree clearing activities between December and March when the Indiana bats are in their hibernacula.

The proposed project may cause impacts to the species by removing summer roost habitat. Minimizing the amount of tree removal within 10 miles of known hibernacula will minimize the loss of potential summer roost habitat, staging, and swarming areas for the species. SA-04 and SA-05 have the potential to impact Indiana bat habitat as both of the alternatives appear to be within 10 miles of Blackball Mine in Illinois, which is designated Critical Habitat for the Indiana bat. Additional analysis and planning efforts will be necessary to avoid and minimize impacts to the species and the species habitat should SA-04 and/or SA-05 move forward.

Reptiles

Eastern Massasauga (Potentially in SA-05)

Eastern massasauga are generally found in floodplain wetlands along rivers and wetlands adjacent to lakes, but they also utilize adjacent upland habitats. The species hibernates in crayfish and small mammal burrows. Ground disturbance could potentially impact the species during hibernation. Project construction and vegetative maintenance activities within inhabited wetlands, adjacent uplands, or at the intersection of these two habitats will likely disturb and possibly displace the eastern massasauga. The species does not generally travel long distances, so impacts to inhabited areas will likely impact the species at the local population level.

Lethal take and disturbance of the eastern massasauga are unlikely if project placement is completed in a manner that will avoid floodplain wetlands, lakeshore wetlands, and adjacent upland habitats. SA-05 is the only alternative which bisects counties in Illinois where the eastern massasauga has been identified. The two mile corridor should allow adequate area for project placement to avoid impacts to the eastern massasauga.

Plants

Western Prairie Fringed Orchid (Potentially in SA-03, SA-04, SA-05, SA-06, SA-07, SA-08, and SA-Applicant)

Western prairie fringed orchid is generally found in undisturbed or minimally disturbed wet meadows and wet prairies. Occasionally the species is found in wet vegetated draws or swales, which have the necessary hydrology maintained by side hill seeps. The western prairie fringed orchid can be negatively impacted by ground disturbance, and continual disturbance regimes; such as; heavy grazing, frequent mowing, or frequent burning.

The proposed project could affect the western prairie fringed orchid during the construction and operational phases. Ground disturbance during construction and placement of the pipeline, and vegetation management activities could impact individual plants or entire local populations depending on the pipeline location. Potential impacts to the species could be avoided or minimized by not placing the pipeline within occupied wet meadow, wet prairie, or wet swale habitat areas. Additionally, the use of BMPs to reduce soil erosion in uplands adjacent to occupied habitats will help to reduce impacts to the species. Directionally boring the pipeline under occupied habitat areas could be used to avoid soil surface disturbance, but the vegetative management activities to maintain the route could potentially affect individual plants if it is not properly timed. All of the system alternatives could negatively affect the western prairie fringed orchid. Additional analysis and planning will be necessary to avoid and minimize impacts to the western prairie fringed orchid as route planning moves forward.

Decurrent False Aster (Potentially in SA-04 and SA-05)

The decurrent false aster is found along the Illinois River on sandy floodplains and in prairie wetlands. This species requires occasional flood disturbance to remove competing plant species. The decurrent false aster appears to be impacted directly and indirectly by agricultural activities. Preferred habitat areas for the species have been drained and/or protected from flooding to allow for row cropping. Additionally, soil erosion caused by intensive farming practices has resulted in increased silt deposition on decurrent false aster seeds and seedlings during flood events.

As the decurrent false aster is only found along the Illinois River, and the proposed project does not cross the Illinois River direct lethal take of the species is not anticipated. Indirect impacts from the proposed project can be avoided and minimized by utilizing BMPs to reduce soil erosion during pipeline construction. Additional analysis and planning will be necessary if SA-04 or SA-05 is selected to move forward in the selection process.

Lakeside Daisy (Potentially in SA-04 and SA-05)

Lakeside daisy is found in dry rocky prairies with underlying limestone bedrock. The species is primarily impacted by limestone quarry mines and collection as a landscaping plant. Fire suppression has increased competition from trees and shrubs in the lakeside daisy's native prairie habitats. The proposed project should be able to avoid occupied habitat during the construction phase by utilizing directional boring. The vegetative clearing needed for right-of-way maintenance may cut some individual plants, but the clearing of shrubs and saplings will reduce competition and may benefit the lakeside daisy.

The proposed project is unlikely to result in the lethal take of the lakeside daisy, but additional analysis and planning may be necessary if SA-04 or SA-05 move forward in the selection process.

Leafy Prairie-clover (Potentially in SA-04 and SA-05)

In Illinois the leafy prairie-clover is only found along the Des Plaines River in remnant native prairies. The species is threatened by residential and commercial development, and it is susceptible to impacts from road construction projects. As the species is located in very limited discreet habitat areas the proposed project should be able to avoid occupied habitat areas during pipeline construction. The proposed project is unlikely to result in lethal take of the leafy prairie-clover.

If SA-04 or SA-05 move forward in the selection process additional analysis and planning may be necessary to avoid impacts to the leafy prairie-clover.

Mead's Milkweed (Potentially in SA-04 and SA-05)

Mead's milkweed is only known to occur in undisturbed native tall grass prairie. The species is threatened by habitat loss, habitat fragmentation, and mowing native prairie habitat for hay production. The proposed project should be able to avoid occupied habitat areas during the construction and placement phase, so the project is unlikely to result in the lethal take of Mead's milkweed.

If SA-04 or SA-05 move forward in the selection process additional analysis and planning may be necessary to avoid impacts to the Mead's milkweed.

Northern Wild Monkshood (Potentially in SA-04 and SA-05)

The northern wild monkshood is found in shaded and partially shaded habitats, such as; cliffs, aligific talus slopes, and cool streamside areas. The presence of this species is specific to areas with cool soil conditions and cold air and groundwater flowages. Cooler air and water conditions are driven by ice present in underground fissures. Sinkhole presence also favors the conditions necessary to support local populations of the northern wild monkshood. The species is threatened by contamination and filling of sinkholes, livestock grazing, foot traffic from livestock and humans, logging, linear infrastructure maintenance (i.e. highways, powerlines), quarrying and road construction. The proposed project could adversely impact the northern wild monkshood during the construction and operations phases through vegetative clearing and ground disturbance. Construction activities below the soil surface could indirectly impact individuals of the species not located in the construction area, as these activities could disrupt the flow of cold air and/or groundwater. Avoidance of project impacts to the northern wild monkshood can be accomplished by not constructing within occupied habitat areas, and by not constructing within close proximity of upslope sinkholes which provide needed cold air and groundwater contributions to the species.

SA-04 and SA-05 could potentially affect the northern wild monkhood, and if either of these alternatives continue forward in the selection process additional analysis and planning will be necessary to avoid impacts to the species.

Prairie Bush-clover (Potentially in SA-04, SA-05, SA-06, SA-07, and SA-08)

Prairie bush-clover is found in minimally disturbed, dry hillside prairies, generally on north facing slopes. The species is negatively impacted by soil surface disturbance, heavy grazing, and frequent mowing. Avoidance of the pipeline placement through dry hillside prairie habitat occupied by prairie bush-clover will avoid impacts to the species, and the implementation of BMPs to reduce soil erosion will minimize impacts to the species if construction activities occur up slope of occupied habitat. Directional boring could be utilized to place the pipeline under occupied habitat, but vegetative maintenance activities conducted along the route could negatively affect the prairie bush-clover if they are not properly timed.

SA-04, SA-05, SA-06, SA-07, and SA-08 could negatively affect the prairie bush-clover. Additional analysis and planning will be necessary to avoid or minimize impacted to the prairie bush-clover should SA-04, SA-05, SA-06, SA-07, or SA-08 move forward in the planning process.

Eastern Prairie Fringed Orchid (Potentially in SA-04 and SA-05)

Eastern prairie fringed orchid is generally found in undisturbed or minimally disturbed wet meadows and wet prairies. The eastern prairie fringed orchid can be negatively impacted by ground disturbance, and continual disturbance regimes such as; heavy grazing, frequent mowing, or frequent burning.

The proposed project could affect the eastern prairie fringed orchid during the construction and operational phases. Ground disturbance during construction and placement of the pipeline, and vegetation management activities could impact individual plants or entire local populations depending on the pipeline location. Potential impacts to the species could be avoided or minimized by not placing the pipeline within occupied wet meadow and wet prairie habitat areas. Additionally, the use of BMPs to reduce soil erosion in uplands adjacent to occupied habitats will help to reduce impacts to the species. Directionally boring the pipeline under occupied habitat areas could be used to avoid soil surface disturbance, but the vegetative management activities to maintain the route could potentially affect individual plants if it is not properly timed. SA-04 and SA-05 could negatively affect the eastern prairie fringed orchid. Additional analysis and planning will be necessary to avoid and minimize impacts to the eastern prairie fringed orchid should SA-04 or SA-05 move forward in the selection process.

Source: U.S. Fish and Wildlife Service, Endangered Species Program, 2014.
http://www.fws.gov/endangered/