

4.0 ENVIRONMENTAL CONSEQUENCES, MITIGATION MEASURES, AND CUMULATIVE IMPACTS

Environmental consequences resulting from the construction, operation, and maintenance of the Project are discussed on a resource-by-resource basis for the No Action and Proposed Action alternatives. Potentially affected resources include topography/physiography, geology, soils, surface and ground water resources, air quality, noise, vegetation, wildlife and fisheries (including federal- and state-listed species), wild and scenic rivers, cultural resources, socioeconomics, land use, and visual resources. Mitigation measures and residual impacts are discussed where appropriate. Resources not affected by the No Action or Proposed Action alternative include climate and environmental justice, therefore, these resources are not discussed further in this EA.

An environmental consequence or impact is defined as a modification of the existing environment brought about as a result of the action or inaction. Impacts can be beneficial or adverse; can be a primary result of the action (direct) or a secondary result (indirect); and can be long-term or short-term. Impacts also may vary in intensity from only a slightly discernible change to a total change in the environment.

Impact evaluation criteria have been established for each potentially affected resource and potential project impacts were assessed for significance based on these criteria. Impact evaluation criteria were developed using reasonable agency expectations and current policy guidelines as well as existing federal, state, and local laws, rules, and regulations.

Short-term impacts are effects on the environment that occur during construction and/or last only a few years after construction. Although short in duration, such impacts are normally obvious and disruptive. For this Project, short-term impacts are defined as lasting 12 years or less; however, should Project construction take longer than 12 years, these impacts would be felt for the entire construction period. Impacts from construction will be present only during the period of construction activity and at specific locations of work. Long-term impacts are changes

made in the environment during construction and operation of the Project that remain longer than 12 years and perhaps for the LOP and beyond.

Cumulative impacts are those which result from the incremental impacts of an action added to other past, present, and reasonably foreseeable actions, regardless of who is responsible for such actions. These impacts are described for each potentially affected resource. Cumulative impact assessment areas vary depending on the resource.

4.1 PHYSICAL RESOURCES

4.1.1 Topography/Physiography

4.1.1.1 Impact Evaluation Criteria

Impacts to topography/physiography would be significant if Project facilities or activities resulted in a change in the overall appearance of the landscape.

4.1.1.2 The No Action Alternative

Under the No Action alternative, the pipeline and associated facilities would not be constructed. There would be no Project-related impacts to physiography/topography from the No Action alternative because no ground would be disturbed.

4.1.1.3 The Proposed Action

No long-term impacts to physiography/topography are anticipated because all but 236 acres of disturbed areas (Table 2.1) would be promptly reclaimed and any temporary disruption in drainage patterns from the Project would be restored. Pipeline construction operations that involve stream or river crossings have the potential to cause short-term disruption of drainages. Approximately 640 wetland areas occur within the study area (proposed pipeline and facilities

sites and a 1.0-mile buffer) (Table 4.1); however, wetland areas were avoided to the maximum extent possible during Project planning. Additional avoidance would occur during IERT reviews (see Appendix A), and any wetland crossings would be conducted in compliance with all appropriate federal and state legislation and IERT guidance.

4.1.1.4 Mitigation

No additional mitigation measures beyond those described in Section 2.2.2 are recommended for topography/physiography.

4.1.1.5 Cumulative Impacts

No cumulative impacts to physiography/topography are anticipated from the Project.

4.1.2 Geology (Geologic Hazards, Mineral Resources, and Paleontological Resources)

4.1.2.1 Impact Evaluation Criteria

Impacts to geology would be significant if Project activities resulted in landslides, subsidence, or increased flooding. Impacts to minerals, specifically quartzite and limestone quarries, sand and gravel pits, and clay and peat beds, would be significant if Project activities resulted in the inability to mine these resources. Impacts to paleontological resources would be significant if important fossils would be directly lost or destroyed during construction or indirectly lost or destroyed due to private collection or vandalism.

4.1.2.2 The No Action Alternative

Under the No Action alternative, there would be no construction (e.g., well development, ground disturbance) at this time, and geologic resources would remain unchanged from their existing

Table 4.1 Maximum Number of Wetland Crossings and Disturbance Area Acreages by State, Lewis and Clark Water Supply Project, 2002.¹

Impacted Wetland Type	Iowa		Minnesota		South Dakota		Total ²	
	No. of Crossings	Acres ²	No. of Crossings	Acres	No. of Crossings	Acres	No. of Crossings	Acres
PEMA ³	16	5.52	5	3.36	50	55.15	71	64.03
PEMC ⁴	34	10.40	29	11.67	92	34.99	155	57.06
Forested ⁵	0	0.00	1	2.03	15	3.18	16	5.21
Riverine ⁶	13	8.37	8	1.51	11	1.36	32	11.24
Other Natural Wetlands ⁷	6	1.47	5	3.57	10	10.30	21	15.34
Man-altered Wetlands ⁸	45	17.10	18	10.42	282	261.54	345	289.06
Total	114	42.86	66	32.56	460	366.52	640	441.94

¹ This table indicates the maximum level of wetland impacts that could result from the Project. The actual number and acreage of wetland crossings will be substantially less than those indicated herein since the majority of wetlands would be avoided during IERT reviews (see Appendix A).

² Acreage computed by multiplying the linear distance of the wetland type crossed by the width of the construction corridor (200 feet for pipes >36 inches; 150 feet for pipes 18-36 inches; and 100 feet for pipes <18 inches); for crossings too short to be measured, the length of the crossing was estimated at approximately 10 feet.

³ PEMA = Palustrine Emergent Temporarily Flooded.

⁴ PEMC = Palustrine Emergent Seasonally Flooded.

⁵ Includes:

PFOA = Palustrine Forested Temporarily Flooded.

PFOC = Palustrine Forested Seasonally Flooded.

PFO/SS1 = Palustrine Forested/Scrub Shrub Broadleaf Deciduous.

⁶ Includes:

R2UBG = Riverine Lower Perennial Unconsolidated Bottom Intermittently Exposed.

R2USA = Riverine Lower Perennial Unconsolidated Shore Temporarily Flooded.

R4SBF = Riverine Intermittent Streambed Semipermanently Flooded.

⁷ Includes:

PEM/ABF = Palustrine Emergent/Aquatic Bed Semipermanently Flooded.

PEMF = Palustrine Emergent Semipermanently Flooded.

PEM/FO = Palustrine Emergent/Forested.

PEM/SS1A = Palustrine Emergent/Scrub Shrub Broadleaf Deciduous Temporarily Flooded.

PSSA = Palustrine Scrub Shrub Temporarily Flooded.

PUB/EMF = Palustrine Unconsolidated Bottom Emergent Semipermanently Flooded.

PUBF = Palustrine Unconsolidated Bottom Semipermanently Flooded.

PUBG = Palustrine Unconsolidated Bottom Intermittently Exposed.

⁸ Includes:

PABFx = Palustrine Aquatic Bed Semipermanently Flooded Excavated.

PEM/ABFx = Palustrine Emergent/Aquatic Bed Semipermanently Flooded Excavated.

PEMAd = Palustrine Emergent Temporarily Flooded Partially Drained Ditched.

PEMAx = Palustrine Emergent Temporarily Flooded Excavated.

PEM/ABFd = Palustrine Emergent/Aquatic Bed Semipermanently Flooded Partially Drained Ditched.

PEMcd = Palustrine Emergent Seasonally Flooded Partially Drained Ditched.

PEMCx = Palustrine Emergent Seasonally Flooded Excavated.

PEMfd = Palustrine Emergent Semipermanently Flooded Partially Drained/Ditched.

PEMfx = Palustrine Emergent Semipermanently Flooded Excavated.

PFOAx = Palustrine Forested Temporarily Flooded Excavated.

PFOCx = Palustrine Forested Seasonally Flooded Excavated.

PUBGx = Palustrine Unconsolidated Bottom Intermittently Exposed Excavated.

PUBHh = Palustrine Unconsolidated Bottom Permanently Flooded Diked/Impounded.

R2UBGx = Riverine Lower Perennial Unconsolidated Bottom Intermittently Exposed Excavated.

R4SBFx = Riverine Intermittent Streambed Semipermanently Flooded Excavated.

condition except as modified by natural causes or otherwise impacted by other non-Project related activities.

4.1.2.3 The Proposed Action

There would be little or no impact to the geology of the area from Project construction. Active mining operations including quartzite and limestone quarries, sand and gravel pits, and clay and peat beds have been avoided during Project planning and would be further avoided during the siting of facilities and final pipeline routes.

While floodplains and flooding may be temporarily impacted by Project construction through bank destabilization and the loss of vegetation within floodplain areas, mitigation activities implemented during construction would alleviate the potential for severe impacts (see Section 2.2.2). The construction, operation, and maintenance of the Proposed Action would not increase the flooding hazard.

No major paleontological resources are known to occur within the Project region (Mariah 1993a). Possible direct impacts could result from the disturbance/destruction of fossil information during construction and indirect disturbance could result from the loss of important fossil materials due to private collection or vandalism facilitated by potential increased public access; however, most of the land within the area is privately owned and, therefore, public access is restricted, limiting potential indirect impacts to paleontological materials.

4.1.2.4 Mitigation

No additional mitigation measures beyond those described in Section 2.2.2 are recommended for geologic hazards or mineral resources.

To reduce direct impacts to paleontological materials, further study of Project-affected outcrops of fossil-bearing formations may be conducted prior to construction, as deemed necessary by

Reclamation and the System in consultation with qualified paleontologists. Avoidance of known paleontological localities may be required, and if avoidance would not be feasible, important localities may be surveyed and monitored during construction, and recovery programs may be required. If paleontological materials are found during construction, all activities in the immediate area would cease, and appropriate personnel would be notified immediately to provide proper handling of the discovery by qualified paleontologists.

4.1.2.5 Cumulative Impacts

No adverse cumulative impacts to geology are anticipated from Project-related activities.

4.1.3 Soils (Steep Slopes, Prime Farmland, Wetland Soils)

4.1.3.1 Impact Evaluation Criteria

Impacts to soils would be significant if a reduction in soil productivity and/or increased erosion would prevent successful reclamation.

4.1.3.2 The No Action Alternative

Under the No Action alternative, there would be no construction/soil disturbance at this time and soils would remain unchanged from their existing condition except as modified by natural causes or otherwise impacted by other non-Project related activities.

4.1.3.3 The Proposed Action

Short-term construction-related impacts would occur on disturbed areas. Construction would increase erosion potential and result in soil loss. However, appropriate mitigation measures would be implemented (see Section 2.2.2).

In areas where Project features would affect wetlands and prime farmlands, potential impacts may include soil loss and erosion, soil modification resulting in the loss of the hydrologic integrity of wetlands, and topsoil compaction or mixing resulting in decreased productivity.

Impacts to prime farmland and wetland soils would be minimized primarily by avoiding placement of permanent facilities in these areas, where practical. Where prime farmlands are lost as a result of this Project, landowners would be compensated at the fair market value for these losses (i.e., crop-loss remediation, land acquisition). Pipeline routes are currently located such that they cross the fewest number of identified wetlands in the Project area, and further pipeline routing modifications would occur during IERT reviews (see Appendix A) such that the majority of wetlands currently within the study area would be avoided. The maximum total area of wetlands impacted by the Project is identified in Table 4.1; however, the majority of these wetlands would be avoided through minor routing modifications conducted during IERT review.

4.1.3.4 Mitigation

Segregated topsoil would be returned to the surface upon construction completion to facilitate successful revegetation and or maintenance of predisturbance crop/vegetation productivity.

Wetlands affected during Project construction would be reclaimed or otherwise mitigated as determined during COE and state permitting actions such that there would be no net loss of wetlands. Impermeable soils and/or plugs may be used in the pipeline trench at wetland crossings to eliminate water leakage within trench bedding materials. If wetland replacement is required, it may involve restoration of drained wetlands, water augmentation of existing wetlands, or wetland creation.

No additional mitigation measures beyond those described in Section 2.2.2 would be required.

4.1.3.5 Cumulative Impacts

The Project would only minimally contribute to the cumulative impacts associated with existing soil loss from farming, urban development, road construction, mining, and other regional activities. A total of 236 acres would be required for the LOP.

4.1.4 Surface Water

4.1.4.1 Impact Evaluation Criteria

Impacts to surface waters would be significant if surface water quality declined such that the existing surface water quality classes (see Section 3.1.5.1) would be downgraded or if surface water quantities were depleted such that the water rights of current users (i.e., irrigation) would be violated.

4.1.4.2 No Action Alternative

Under the No Action alternative, there would be no construction/surface disturbance at this time and surface water resources would remain unchanged in the Missouri River and continue to be depleted in other areas where they provide an existing source of drinking water. Due to the existing water quality and quantity problems associated with existing water systems and anticipated increases in water demand, additional water resources would eventually be required. The anticipated increase in the number of water users throughout the region and the subsequent increase in water demand indicate that additional water resources will eventually be required (COE 1989a, 1989b). Additionally, tentative increased standards in the SDWA will require that some existing water users secure alternative or further processed waters. These actions may include further tapping of surficial or deep aquifers or piping water from alternate surface water locations. Impacts resulting from these actions may be more detrimental to the environment than the Project. In addition, the flexibility to transport water throughout the region to meet current

and future demands for water would be lost as would the opportunity to sustain current and projected regional economic growth and development (see also Section 4.1.5.2).

4.1.4.3 Proposed Action

Generally, there would be no impact to the lakes or ponds within the Project area since these features would be avoided during pipeline routing. Many lakes and ponds in the area are maintained by ground water discharge. Decreased localized use of ground water by system member entities may augment water levels in some of these surface waters, providing a positive impact.

The inter-basin transfer of biota is not expected since all Project waters would be treated to acceptable drinking water standards prior to delivery.

Numerous rivers and streams would be crossed during pipeline construction (see Table 4.1). River and stream crossings would be conducted in compliance with all appropriate federal and state legislation. Potential adverse impacts to these waters would be temporary and include bank damage, associated increases in erosion and sedimentation, modification of streambeds supporting aquatic biota, loss of riparian habitat, and fuel spills during construction. Impacts from erosion would be short-term and moderate in intensity during Project construction. Fuel spills are unlikely and present a short-term low potential impact during Project construction.

Decreased dependence on surficial aquifers throughout the Project area may have a long-term beneficial effect to rivers and streams. Since many of the surficial aquifers currently utilized to provide water to system member entities are associated with the rivers of the area, decreased use of these waters may increase surface water availability along some stream reaches.

It is assumed that the water pumped from the alluvial aquifers adjacent to the Missouri River by this Project would eventually be lost to the Missouri River while being used for the Project.

Therefore, river flow rate reduction concerns associated with pumping surface water directly from the river are equally valid for pumping water from the collector wells (personal communication, July 2001, Wayne Werkmeister, National Park Service). Potential impacts to the Missouri River would include decreased flow rates and minimal levels of increased erosion and sedimentation associated with the well field. The estimated maximum withdrawal of 32 MGD of water from the Missouri River alluvial aquifer amounts to less than 0.8% of the minimum allowable flow from the Gavins Point Dam, and peak Project demand is not anticipated to coincide with periods of low flow within the river. In addition, the majority of water withdrawn from the Missouri River aquifer would be discharged as purified wastewater elsewhere within the watershed. The impact potential of decreased flows, therefore, is considered low, as are impacts associated with erosion and sedimentation due to the application of appropriate mitigation measures (see Section 2.2.2).

4.1.4.4 Mitigation

No additional mitigation measures beyond those described in Section 2.2.2 are recommended.

4.1.4.5 Cumulative Impacts

Surface water resource cumulative impacts include the diversion of water from the Missouri River aquifer. The projected average water withdrawal from the Missouri River aquifer of approximately 22 to 23 MGD is less than 0.7% of the minimum allowable flow from Gavins Point Dam (i.e., 6,000 cfs). The Project contribution to overall depletions within the river would have negligible effects to fisheries, recreational values, or navigational capabilities. The majority of water utilized for the Project would eventually return to Missouri River tributaries from wastewater treatment facilities, and the potential lowered use of surface waters and surficial aquifers within the area would also augment flows within these tributaries. Only the waters used

at Worthington, Minnesota, that are treated by the city sewage system would be lost from the Missouri River watershed; however, the small volume of this loss would be insignificant even in the event of further water withdrawals from the Missouri River due to future regional actions.

4.1.5 Ground Water

4.1.5.1 Impact Evaluation Criteria

Impacts to ground water resources would be significant if water quality and quantity declined such that the water rights of current users and/or state standards (beneficial uses) would be violated, and/or ground water levels in the vicinity of the well field decline to the point where permanent changes to riparian vegetation occurs.

4.1.5.2 No Action Alternative

Under the No Action alternative, the current use of both surficial and deep water aquifers would continue and some existing member entities currently utilize aquifers with little or no natural recharge which will eventually be depleted. Additionally, contaminant concentrations may continue to increase in concentration in these aquifers as aquifer water volumes decline. While existing efforts in ground water and surface water conservation and protection will assist in promoting and maintaining water quality and quantity, these efforts will be inadequate as populations increase. The water conservation program proposed for development under the Proposed Action would not be implemented under the No Action alternative. There would be no impact to the alluvial aquifers adjacent to the Missouri River since no wells would be developed.

4.1.5.3 The Proposed Action

The majority of impacts to ground water resulting from the Project would be long term and beneficial. Lowered use of some aquifers within the Project area would allow greater aquifer

recharge and subsequently increase the quantity and quality (dilution effects) of ground water within these systems. Water users drawing upon these aquifers as their primary source of drinking water would benefit through greater water availability and quality.

Of notable concern within the Project region is the potential for ground water resources to become further limited and for continued ground water contamination from surface sources; for example, the ground water resources within the Big Sioux River aquifer (Sioux Falls management unit) have been fully appropriated. By providing adequate supplies of good quality water to the region, current activities in ground water conservation and protection may be lost, further threatening these resources. While the potential for these problems would be long term, mitigation measures including a Project-specific water conservation program would be implemented.

Detailed information on the potential draw down of ground water in the vicinity of the well field is provided in LLC (2001b) and Banner et al. (2002). While some draw down is anticipated, no effects to riparian vegetation are anticipated since ground water levels in the area are generally greater than 15 feet deep.

4.1.5.4 Mitigation

The proposed water treatment plant would have drying lagoons for sludge and fuel and chemical storage tanks. To prevent impacts to ground water beneath these facilities, sludge lagoons would be constructed to meet state design standards for seepage rates, and fuel and chemical storage facilities would be built with secondary containment features. If a spill were to occur, clean-up in accordance with applicable federal and state guidelines would be implemented.

The System would continue promoting ground water conservation and protection efforts among its membership. Efforts would include dissemination of information about conservation, which may include lawn watering restrictions and household conservation measures. Additional efforts

may be required by System member entities or respective states to continue aquifer protection practices.

No additional measures beyond those described in Section 2.2.2 are recommended.

4.1.5.5 Cumulative Impacts

Most of the projected water withdrawal from the alluvial aquifers adjacent to the Missouri River would eventually return to Missouri River tributaries. Only the waters distributed to Worthington, Minnesota, would be lost from the watershed.

4.1.6 Air Quality

4.1.6.1 Impact Evaluation Criteria

Impacts to air quality would be significant if they resulted in a violation of federal and/or state air quality attainment standards.

4.1.6.2 No Action Alternative

Under the No Action alternative, there would be no construction at this time and air quality would remain unchanged from existing conditions except as modified by natural causes or otherwise impacted by other non-Project related activities.

4.1.6.3 The Proposed Action

Air quality impacts resulting from the Project would primarily be short term (occurring during construction) and occur at low levels; most long-term Project facilities would be electrically powered using the existing power infrastructure. Impacts primarily would result from equipment emissions and fugitive dust and would be mitigated by keeping all construction vehicles well-

maintained and by watering construction areas during dry periods. At least one well site, the treatment plant, and some of the pump stations would have generators which would be operated primarily for exercise purposes, in the event of electrical-service interruption, and/or to reduce Project electrical costs (peak shaving). These and other long-term Project facilities would be appropriately permitted such that ambient air quality standards would not be exceeded.

4.1.6.4 Mitigation

No additional mitigation measures beyond those described in Section 2.2.2 are recommended.

4.1.6.5 Cumulative Impacts

Cumulative impacts to air quality would be negligible because pipeline construction would be temporary and would occur over a 12-year period. The well field facility, treatment plant, and pump stations primarily would be powered electrically through the existing power infrastructure and, therefore, cumulative impacts to air quality would occur within the parameters of existing power plant air quality permit obligations.

4.1.7 Noise

4.1.7.1 Impact Evaluation Criteria

Impacts to noise would be significant if long-term Project activities would exceed the federal 55-dBA standard for noise at residences and/or other noise-sensitive locations such as piping plover and interior least tern nests during breeding and nesting seasons and winter bald eagle roost sites.

4.1.7.2 No Action Alternative

Under the No Action alternative, there would be no construction at this time and noise levels would remain unchanged from their existing condition except as modified by natural causes or otherwise impacted by other non-Project related activities.

4.1.7.3 The Proposed Action

Noise levels within the Project area could exceed background noise levels during Project construction, and these noise levels could be as high as 100 dBA for short periods; however, no long-term noises greater than 55 dBA are anticipated at residences or other noise sensitive locations. Noise impacts would occur during construction and be moderate in intensity but are not expected to exceed levels produced by existing farm machinery presently used in the area. While the majority of area residents would be located at a sufficient distance from noise sources such that noise levels would not be an annoyance, some residents may be disturbed by noise levels.

The operation of the treatment plant and pump stations would also generate noise throughout the LOP. Pumps and generators would be housed within facility structures. To contain the noise generated at facility sites determined to be in noise-sensitive areas (e.g., well field pump houses), cavity-walled, sound-absorbing masonry units and/or insulation would be used and the level of noise escaping from these facilities would be negligible. It is anticipated that the noise generated by pumps and generators at the well field would be less than the noise from boats on the Missouri River, and that the noise generated by the treatment plant would be less than the noise from nearby operating farm equipment.

4.1.7.4 Mitigation

No additional mitigation measures beyond those described in Section 2.2.2 are recommended.

4.1.7.5 Cumulative Impacts

Cumulative impacts to noise would be negligible because pipeline construction would be temporary and occur over a 10- to 12-year period. The well facility, treatment plant, and pump stations would also generate noise throughout the LOP.

4.2 BIOLOGICAL RESOURCES

4.2.1 Vegetation

4.2.1.1 Impact Evaluation Criteria

Impacts to vegetation would be significant if there was a long-term reduction in vegetation productivity or a permanent change in species composition. Impacts to wetlands and riparian areas would be significant if there would be a violation of Section 404 of the *Clean Water Act* or Executive Orders 11988 or 11990. Project impacts would be significant if they resulted in the unreasonable spread of invasive non-native species (noxious weeds).

4.2.1.2 No Action Alternative

Under the No Action alternative, there would be no construction/surface disturbance at this time, and vegetation, wetlands, and riparian areas would remain undisturbed from existing conditions except as modified by natural causes or otherwise impacted by other non-Project related activities. Since no vegetation would be disturbed, areas suitable for the spread of noxious weeds would not be present, and no increase in the abundance or distribution of noxious weeds would occur.

4.2.1.3 The Proposed Action

Croplands would constitute the vast majority of Project-affected lands; however, some pasturelands, grasslands, woodlots/windbreaks, riparian forests, and wetlands would be impacted. Where possible, grasslands, native prairie areas, woodlots/windbreaks, riparian forests, and wetlands would be avoided during construction and for permanent facility sites.

Construction would result in the temporary removal and/or the alteration of vegetation within the construction ROW (approximately 7,700 acres [see Table 2.1]). Removal of vegetation,

changes in vegetation type (e.g., forest to grassland), potential for accelerated erosion, and the increased likelihood for noxious weed invasion on disturbed areas constitute potential short-term impacts to the vegetation on Project-disturbed areas.

Riparian vegetation would be impacted where pipelines cross rivers, streams, and other wetlands (see Table 4.1); however, the majority of these areas would be avoided during routing. No effects to riparian vegetation in the vicinity of the well field as a result of ground water draw down are anticipated (see Section 4.1.5.3). Crossings of all wetland areas would follow COE best management practices as identified in Section 404 permit regulations; a project-wide national 404 permit should be sufficient for all wetland crossings. Section 10 permits would be required for river crossings as per Section 10 regulations of the *Rivers and Harbors Act of 1899* (33 U.S.C. 403).

Vegetation would be permanently lost from facility sites (approximately 236 acres [see Table 2.1]). To minimize potential impacts from these Project components, above-ground facilities other than those at the well field, would not be located on wetland, native prairie, or other natural areas. The well field and associated access roads would, by necessity, be constructed in a relatively undisturbed area on the northern bank of the Missouri River, resulting in the long-term transformation of approximately 7 acres. However, impacts from the well field would be considerably less than those from the scattered existing developments in this area which include cropping, road ROWs, material borrow areas, and houses.

4.2.1.4 Mitigation

Topsoil would be segregated from subsoils during all construction operations requiring excavation. Segregated topsoil would be returned to the surface upon completion of operation to facilitate the likelihood of successful revegetation and or maintenance of predisturbance crop/vegetation productivity.

Wetlands and other important habitats that may be affected as a result of Project construction would be reclaimed/replaced such that there would be no net loss of wetlands or other important habitats. Wetland replacement may involve restoration of drained wetlands, water augmentation of existing wetlands, or wetland creation; whereas other important habitats (e.g., wooded locations at the proposed well field) would be replaced using methods identified during IERT review, which may include habitat improvements, land acquisitions, and/or land preservation actions at alternative sites.

No additional mitigation measures other than those described in Section 2.2.2 are recommended.

4.2.1.5 Cumulative Impacts

Vegetation conversions/loss would occur at permanent facility sites. However, most Project disturbance would occur on previously disturbed areas (i.e., croplands, road and railroad ROWs), and most newly disturbed areas would be reclaimed soon after disturbance. Construction of facilities would result in the permanent land use change of approximately 236 acres. While immediate habitat loss could result in wildlife displacement leaving animals more susceptible to disease, predation, and hunting pressures, important habitats lost for permanent facility sites (e.g., the 7 acres at the well field) would be replaced on an acre-for-acre basis with habitat of equal value at alternative locations. Cumulative vegetation losses, therefore, would be negligible and occur only during the period required for most areas to reach pre-disturbance growth stages.

Adverse cumulative impacts as a result of the spread of noxious weeds would be limited because of the application of appropriate weed control measures.

4.2.2 Wildlife and Fisheries

4.2.2.1 Impact Evaluation Criteria

Impacts to wildlife and fisheries resources would be significant if they prevent realization of wildlife population objectives or result in the loss of a population of any species.

4.2.2.2 No Action Alternative

Under the No Action alternative, there would be no construction/surface disturbances at this time and impacts to wildlife populations would likely remain unchanged from their existing condition except as modified by natural causes or otherwise impacted by other non-Project related activities.

4.2.2.3 The Proposed Action

Impacts to the wildlife resource from Project construction would generally be from temporary loss of habitat and short-term disruption during construction. While approximately 236 acres of land would experience a change in use, only along the Missouri River would an area of important wildlife habitat be permanently removed (approximately 7 acres), and this lost habitat would be replaced on an acre-for-acre basis with habitat of equal value using methods developed during IERT review which may include habitat improvements, land acquisitions, and/or land preservation at alternate sites. All other required permanent facilities would be located on lands away from native/natural areas and, therefore, would not require replacement.

Direct Project impacts would include the direct mortality of wildlife caused by construction activities (e.g., ground nesting and burrowing species) and displacement of organisms within the immediate vicinity of construction sites. Given the higher concentrations of wildlife in riparian areas, construction activities at river, stream, and wetland crossings would be expected to have the greatest impact to wildlife.

Localized increases in turbidity and sediment loads associated with construction activities at river and stream crossings would have a short-term low-level impact on Project-area fisheries. These impacts are expected to be minimal since fish and other non-sessile aquatic organisms would avoid areas of temporary disturbance, and sessile organisms such as mollusks and other benthic invertebrates are adapted to fluctuating turbidity and would respond accordingly. Since local increases in turbidity are transient and would be minimized with proper construction practices

(see Section 2.2.2), fish and other displaced aquatic organisms are expected to return to areas impacted during construction.

The City of Worthington is proposed to receive approximately 1.73 MGD of Project water. This water would supplement/replace Worthington's existing water source. However, water supplied to the City of Worthington by the Project is not expected to increase flooding and adversely impact the Heron Lake Watershed because discharges by the City of Worthington would not exceed those designated by the Minnesota Pollution Control Agency.

Potential habitat loss from Missouri River flow depletion would be long-term, but no mitigations would be employed since the maximum estimated flow rate reduction would be less than 0.8% of the minimum allowable river flow, and the majority of waters removed from the river would be returned to the watershed as treated wastewaters at alternative locations. The decreased reliance on surficial aquifers and surface waters at other locations within the Project area would probably augment surface water availability proximal to these areas.

4.2.2.4 Mitigation

No additional mitigation measures beyond those described in Section 2.2.2 are recommended.

4.2.2.5 Cumulative Impacts

Construction of facilities would result in the permanent land use change of approximately 236 acres. While immediate habitat loss could result in wildlife displacement leaving animals more susceptible to disease, predation, and hunting pressures, all important habitats (e.g., wetlands, native prairie, woodlands) lost would be replaced on an acre-for-acre basis with habitats of equal value as identified during IERT reviews. In addition, most of the proposed disturbance would occur on previously disturbed areas (i.e., croplands, road and railroad

ROWs), and most newly disturbed areas would be reclaimed soon after disturbance. Cumulative losses, therefore, would be negligible.

4.2.3 Threatened and Endangered (T&E), and State-Listed Species

4.2.3.1 Impact Evaluation Criteria

Any action that would adversely affect or jeopardize federally listed T&E species or their critical habitat, and/or any recovery program for such species, would be a significant impact. Any construction action that would be the primary cause of a state-listed species to become federally listed would be a significant impact.

4.2.3.2 No Action Alternative

Under the No Action alternative, there would be no construction, surface disturbance, or Missouri River water withdrawals at this time, and impacts to federal- and state-listed species would continue at levels determined by current non-Project related activities.

4.2.3.3 The Proposed Action

Numerous federally listed species may be present within the Project area, and potential habitat for these species may be temporarily altered during Project construction. Informal Section 7 consultation under the *Endangered Species Act* has been completed (see the BA for this Project [TRC Mariah 2002] and Appendix G, Section G.1). It was determined that by utilizing appropriate mitigation measures (see Section 2.2.2) during Project construction, the proposed Project would have "no effect" or "is not likely to adversely affect" listed species or critical habitat. Also, the proposed Project would not adversely modify proposed critical habitat. The

USFWS concurred with these determinations. Table 4.2 summarizes the potential impacts, anticipated effects, and mitigation measures for T&E species which are fully discussed in the BA (TRC Mariah 2002). Mitigations involving habitat avoidance; construction outside of breeding, nesting, roosting, and spawning periods; avoidance of native prairie/natural areas and wildlife production areas; and the use of appropriate construction technologies would facilitate the protection of these species.

Specific habitat requirements limit the distribution of many of the federal- and state-listed species and natural communities present in the Project area. Habitat of aquatic species is limited in the area as a result of stream channelization, reductions in discharge, and changes in water quality. Habitat of terrestrial and avian species is primarily limited by the conversion of native/natural areas to alternative types of land uses (e.g., agricultural, residential). Alterations in streamflows and water quality would be minimal, most native/natural areas would be avoided, and where these areas would be potentially affected, they would be replaced on an acre-for-acre or greater basis with habitat of equal value.

4.2.3.4 Mitigation

The system would support and implement activities as defined in the IERT Guidelines (see Appendix A). Comprehensive site-specific inventories would be conducted annually during Project construction to minimize the potential for adverse environmental effects. These multi-agency site-specific inventories would be conducted to assess the reclamation status of past construction actions, to identify appropriate remedial actions where problems may be found, and to develop appropriate location and design criteria for upcoming Project construction actions.

Table 4.2 Summary of Potential Impacts and Mitigation Measures to T&E Species.

Species	Species Occurrence ¹ and Level of Potential Impact Without Mitigation ²												Potential Impacts	Anticipated Effect	Mitigation Measures ³	
	Month															
	J	F	M	A	M	J	J	A	S	O	N	D				
Bald eagle	C H	C H	C H	C H	u M	u M	u M	u M	u M	C H	x O	C H	C H	Loss of roosts/perches; disturbance from noise and activities; increased human access to winter use sites; power line electrocution and strike hazards	Not likely to adversely affect	Identify and avoid roost, nest, perch, and winter use sites; restrict public access to access/maintenance roads; bury power lines or design them to minimize strike and electrocution hazards (APLIC 1994, 1996)
Least tern	x O	x O	C H	C H	C H	C H	C H	x O	x O	x O	x O	x O	x O	Disturbance during nesting season; increased public access to nest sites	Not likely to adversely affect	Avoid construction during nesting season within 0.25 mi of potential nesting habitat; restrict public access to access/maintenance roads
Piping plover	x O	C H	C H	C H	C H	C H	C H	x O	x O	x O	x O	x O	x O	Disturbance during nesting season; increased public access to nest sites	Not likely to adversely affect	Avoid construction during nesting season within 0.25 mi of potential nesting habitat; restrict public access to access/maintenance roads
Pallid sturgeon	r L	r L	r M	r M	r M	r M	r M	r L	r L	r L	r L	r L	r L	Potential sedimentation in waterways; disturbance during spawning	No effect	Use best management practices as described in Section 2.2.2; avoid construction during spawning seasons.
Topeka shiner	C L	C L	C M	C M	C M	C M	C M	C L	C L	C L	C L	C L	C L	Potential sedimentation in waterways; disturbance during spawning	Not likely to adversely affect	Use best management practices as described in Section 2.2.2; avoid construction during spawning seasons.
American burying beetle	x L	x L	x L	x L	x L	x L	x L	x L	x L	x L	x L	x L	x L	Loss of individuals and habitat possible but unlikely	Not likely to adversely affect	Survey potential habitat to determine presence/absence; avoid individuals or populations if found; avoid potential habitat, where practicable
Scaleshell mussel	r O	r O	r O	r O	r O	r O	r O	r O	r O	r O	r O	r O	r O	No impact is expected	No effect	None

Table 4.2 (Continued)

Species	Species Occurrence ¹ and Level of Potential Impact Without Mitigation ²												Potential Impacts	Anticipated Effect	Mitigation Measures ³	
	Month															
	J	F	M	A	M	J	J	A	S	O	N	D				
Western prairie fringed orchid	x L	x L	x L	x L	x L	x L	x L	x L	x L	x L	x L	x L	x L	Destruction of individuals and habitat possible but unlikely	Not likely to adversely affect	Survey potential habitat to determine presence/absence; avoid individuals or populations if found; avoid potential habitat, where practical
Prairie bush-clover	x L	x L	x L	x L	x L	x L	x L	x L	x L	x L	x L	x L	x L	Destruction of individuals and habitat possible but unlikely	Not likely to adversely affect	Survey potential habitat to determine presence/absence; avoid individuals or populations if found; avoid potential habitat, where practical

¹ Species Occurrence = a relative measure of the species' "presence" in the Project's impact area.
 C = Locally common. Species could occur in abundant numbers, but only in widely scattered or isolated populations. Populations or individuals probably would be encountered during construction, but only at one or two sites in the Project area. Species could be present for a significant part of the year (e.g., breeding season, summer resident) or the entire year.
 u = Uncommon. Species may be present in the Project area, but in such low numbers or in such small and widely-scattered populations that an encounter during construction is unlikely. The species could be present for a significant part of the year (e.g., breeding season, summer resident) or the entire year.
 r = Rare. Species occurrence on the Project area likely would be limited to a few days or hours (e.g., stopping over during migration) or the species has only occasionally or rarely been sighted in the Project area. Encounters during construction are very unlikely.
 x = Unlikely. There has been no recent historical record of the species' occurrence in the Project area. The probability of encountering the species during construction is unlikely.

² Level of potential impact without mitigation = a relative measure of the intensity or seriousness of the Project's potential impacts on the species without mitigation. Adapted from Reclamation (1991).
 H = high
 M = moderate
 L = low
 O = no impact

³ Mitigation measures are presented in detail for each species in Section 2.2.2.

Once exact locations of pipeline routes and facility sites have been identified, further research into the possibility of federal- and state-listed species or natural area presence within the impact or study area would be conducted (e.g., least tern and piping plover nesting habitat in the area of the proposed intake facility, native prairies along the pipeline route). Areas providing potential T&E species habitat may be surveyed prior to construction to verify species presence or absence. The need to conduct surveys would be based on consultation with USFWS, state agencies, and the IERT. If T&E species are found to be present, the Project features would be relocated or otherwise appropriately mitigated under IERT guidance to avoid adverse effects.

Site-specific investigations for state-listed species and natural areas may be required prior to Project construction as determined during IERT reviews. No additional mitigation measures beyond those described in Section 2.2.2 are recommended.

4.2.3.5 Cumulative Impacts

Since areas providing potential federal- and state-listed species habitat would be identified during IERT annual field reviews and these areas would be avoided or surveyed prior to construction, no cumulative impacts to these species are anticipated from the Project.

4.3 WILD AND SCENIC RIVERS

4.3.1 Impact Evaluation Criteria

Impacts to the Missouri River would be significant if Project-related activities resulted in a violation of its National Recreation River designation under the *Wild and Scenic Rivers Act*.

4.3.2 No Action Alternative

Under the No Action alternative, there would be no construction/water withdrawals at this time; therefore, the recreational quality of the Missouri River would remain unchanged from its

existing condition except as modified by natural causes or otherwise impacted by other non-Project related activities.

4.3.3 The Proposed Action

The Missouri River downstream of Gavins Point Dam to the Ponca State Park is classified as a recreational river under the *Wild and Scenic Rivers Act*, and the U.S. Secretary of the Interior is mandated to protect and enhance the river's recreational values, as directed by the National Park Service and COE. The National Park Service has evaluated the proposed Project under the authority of Section 7 of the *Wild and Scenic Rivers Act* and has determined that the Project would not have a direct and adverse effect on the values for which the National Recreation River designation was made (see Appendix G, Section G.13). There would be direct impacts to the river as a result of decreased flows; however, this flow reduction essentially would be masked by the flow management actions implemented at Gavins Point Dam. The minimum and maximum daily flows from the Gavins Point Dam at the beginning of the wild and scenic river reach are approximately 6,000 cfs and 80,000 cfs, respectively. The maximum water intake for the proposed Project is estimated to be 32 MGD or approximately 0.8% of the minimum flow, and the average Project water intake would be 22 to 23 MGD or less than 0.7% of Missouri River minimum flows. Additionally, peak demands are not anticipated to coincide with minimum flows.

Potential decreases in flow rates within this section of the Missouri River would be minimal and long term.

Development and operation of the proposed well field has the potential to create visual and noise impacts in the vicinity of the field, potentially affecting ORVs including the river's recreational qualities (scenic values/visual resource), and noise, surface disturbance, and potential erosion/sedimentation impacts may also affect T&E and other fish and wildlife resources. Implementation of mitigation measures would be as described in Section 2.2.2.

4.3.4 Mitigation

No additional mitigation measures beyond those described in Section 2.2.2 are recommended.

4.3.5 Cumulative Impacts

The primary area of potential cumulative effects to Wild and Scenic Rivers has been identified as water withdrawals from the Missouri River. The potential for cumulative impacts from water withdrawals is discussed in EA Section 4.1.4.5. Cumulative impacts to scenic values and fish and wildlife resources are not anticipated.

4.4 CULTURAL/HISTORIC RESOURCES

4.4.1 Impact Evaluation Criteria

Significant impacts to cultural/historic resources can occur if NRHP-eligible or -listed historic properties are impacted such that their value as cultural resources is diminished or their historic property integrity is diminished by Project activities. Significant impacts could also occur where Project activities result in unwanted effects to ITAs, traditional cultural properties, and/or areas identified by Native American groups as sensitive.

4.4.2 No Action Alternative

Under the No Action alternative, no additional impacts to cultural and historic resources would occur since there would be no new ground disturbance.

4.4.3 The Proposed Action

Potential direct impacts to cultural resources including cultural/historic landscapes from the Project would be limited to the impact area and would include the loss of historic properties

during construction. These impacts would be short-term. Mitigation would include the avoidance of all NRHP-eligible or -unevaluated sites identified in the Level I surveys, where practical (see Section 3.4), implementation of a Level III survey prior to construction activities, and adherence to IERT Guidelines (Appendix A) and, in South Dakota and Minnesota, the Programmatic Agreement for this Project (Appendix E). Appropriate testing/data recovery would be initiated if significant sites cannot be avoided. Trench monitoring would be conducted in areas with high cultural resource potential, and construction activities would cease in the immediate area if significant artifacts are discovered.

Indirect cultural resource impacts may also result from the Project. These impacts would be long-term in duration, resulting from increased access to sites left exposed after completion of construction. Most of the land within the area is privately owned, thereby restricting public access and limiting potential indirect cultural resource impacts to low levels.

Furthermore, consultation with Native American groups would be conducted if religious or culturally important sites are identified within affected areas, and Reclamation would review the potential impacts on a site-specific basis to determine what measures are necessary to prevent or mitigate impacts to religious or culturally important areas. No ITAs, sacred sites, or traditional cultural properties are known for the impacted areas; therefore, they would not be impacted. While the proposed treatment plant may be visible from Spirit Mound, the plant would be located in an area currently having power lines, roads, farmed fields, and other developments such that it likely would not be recognizable from Spirit Mound. Surveys to determine the presence of eligible cultural resources, applicant-committed practices (see Section 2.2.2), implementation of the Programmatic Agreement in South Dakota and Minnesota (see Appendix E), and continued consultation with Native American groups, as necessary, would limit potential impacts to cultural resources from the Project.

4.4.4 Mitigation

Impacts to cultural resources would be mitigated following procedures as specified in 36 C.F.R. 800 and/or the Programmatic Agreement (South Dakota and Minnesota only) developed for the System (see Appendix E). Database and field inventories would be conducted prior to disturbance on all lands. Where landowners deny access, alternative cultural resource mitigation resolution methodologies may be applied. In selective areas identified by Reclamation in consultation with the IERT, testing to determine site significance may be required. All resources identified during these inventories would be evaluated for eligibility to the NRHP by Reclamation, and SHPO would be consulted as necessary under state protocols. In addition, all eligible or listed sites identified in the inventories would be avoided or mitigated. If any NRHP-eligible or -listed sites found within proposed disturbance areas cannot be avoided, a data recovery program or other mitigation would be implemented as deemed appropriate by Reclamation in consultation with SHPO, the Advisory Council on Historic Preservation (as necessary), and the System. Cultural sites identified during inventories would be avoided, where practical.

In addition to database and field inventories, construction activities in areas where Reclamation believes there is a high potential for buried cultural deposits may be monitored by an archaeologist. If historic or prehistoric materials are discovered during construction, further surface-disturbing activities within 100-ft would cease immediately, and appropriate Reclamation personnel would be notified by the System to assure proper handling of the discovery by qualified archaeologists. An evaluation would be made by Reclamation in consultation with SHPO to determine appropriate actions to prevent the loss of significant cultural resources. The System may be responsible for the cost of site evaluation and mitigation, and any decision as to proper mitigation measures (e.g., data recovery) would be made by Reclamation after consulting with SHPO, the Advisory Council on Historic Preservation, as appropriate, and the System

Reclamation may require that all field personnel be informed by the System of the importance of cultural resources and the regulatory obligations to protect such resources. Any cultural

resource (historic or prehistoric site or object) discovered on public land by the System or any person working on their behalf would be immediately reported to Reclamation. Reclamation may require the System to instruct field personnel not to disturb cultural resource sites or collect artifacts and that disturbance and collection of cultural materials is prohibited by law.

No additional measures beyond those described in Section 2.2.2, Appendix A, and Appendix E are recommended.

4.4.5 Cumulative Impacts

No cumulative impacts to cultural/historic resources are expected from disturbance and/or loss of unidentified sites or artifacts, since these resources would be identified, inventoried, and appropriately protected prior to disturbance, and/or mitigated.

4.5 SOCIOECONOMICS

4.5.1 Impact Evaluation Criteria

Impacts to socioeconomics would be significant if they increased demand for housing or local government facilities in excess of availability.

4.5.2 The No Action Alternative

Impacts to socioeconomic resources under the No Action alternative would occur as a result of the continued use of increasingly inadequate water supplies by System member entities, and these supplies may not be adequate to accommodate anticipated population and industrial growth in the Project area. Water quality from ground water sources would continue to need expensive alternative treatment, and greater demands would be placed on surface water resources over the long term.

For the No Action alternative, there would be no increase in employment and/or local sales and use taxes to cities, counties, and states (Table 4.3). Operation and maintenance expenses for existing water supply systems would continue to rise under the No Action alternative due to the costs of multiple supply and treatment facilities. However, communities still retiring debt on their facilities would continue to receive revenues with which to service that debt. The No Action alternative would not provide the beneficial socioeconomic impacts that would be realized by the Project and adverse socioeconomic impacts would continue.

To meet SDWA guidelines and user demands, some water user groups will have to take actions to secure and/or process additional water. These actions may include further tapping of surficial (shallow) or deep aquifers or piping water from alternate surface and/or ground water source locations. Impacts resulting from these actions may be more detrimental to the environment than the Proposed Action. In addition, the flexibility to transport water throughout the region to meet current and future quantity and quality water demands would be lost as a result of the No Action alternative, as would opportunities to sustain current and projected regional economic growth and development.

Under the No Action alternative, poor quality/limited quantity drinking water would continue to be consumed by member entities.

4.5.3 Proposed Action

It is anticipated that most of the materials used to build the Project would come from outside the region. However, each state would directly benefit from sales taxes paid on materials used in Project construction even though they may be purchased outside the region. Local area economies would also directly benefit from contractor excise taxes, taxes paid for fuel used to operate construction equipment, and income taxes on construction worker wages. Additionally,

Table 4.3 Potential Socioeconomic Impacts, Lewis and Clark Water Supply Project, 2002.

Category	Proposed Action	No Action
Type of Project	Rural Water System	None
Construction Duration	12 years	None
Construction Employment	562.4 worker-years	None
Operation/Maintenance Employment	15 workers for 50-year LOP	None
Payrolls	Increased regional work force payrolls	None
Population	No change/most workers would be local hires	Same as Proposed Action
Housing	No change/no large-scale increase in immigration for the Project	Same as Proposed Action
Schools	Increased revenue availability/no large-scale influx of new students	Same as Proposed Action
Local Sales and Use Taxes	Increased revenues	None
Water Rates	May increase	Loss of fees to municipalities
Water Softening Treatment	May decrease due to "softer" water	Continued expense for water softening treatment
Easements/Land Acquisitions	Appropriate payments to land owners	None
Social Indicators	Decreased unemployment; adequate quality and quantity water supply to accommodate anticipated regional growth	No change in unemployment; increased inability to sustain growth; increased demands on lower quality and quantity water supply; increased need to develop alternative water supplies and treatment systems
Communities Directly Affected	15 counties in Iowa, Minnesota, and South Dakota with a current population of approximately 354,300	Same as Proposed Action

state economies would benefit from the multiplier effect that would result from increased capital expenditures. While a relatively large number of skilled and unskilled laborers would be required during Project construction, the available labor supply within the region appears to be sufficient for Project needs. State economies would benefit from the multiplier effect that would result from construction worker income. Because the magnitude of expenditures for operation and maintenance is smaller than for construction, the total LOP impacts due to increased regional payrolls would be less than that occurring during construction. These activities would, however, last for the duration of the Project; consequently, their impacts on state and local economies would be of longer duration.

No additional demands to housing or school systems would occur as a result of the Project.

The rate of regional development is not expected to increase as a result of the Project; the Project is designed only to accommodate anticipated growth by member entities.

An additional indirect socioeconomic impact resulting from the Project would be the potential retirement of existing water treatment facilities. Only a single water treatment plant would be required for the Project, and some existing treatment facilities would be redundant and unnecessary. Additionally, altered rates paid for water may also result from Project implementation, and changes in fee schedules may be substantial for some users. However, Project water may be "softer" than the water currently used by some System members, resulting in a decreased need for water softeners and associated member cost savings.

4.5.4 Mitigation

No additional mitigation measures beyond those described in Section 2.2.2 are recommended.

4.5.5 Cumulative Impacts

The Project can generally be envisioned as growth-accommodating, rather than growth-inducing. Because of the tenuous connection between the provision of a dependable potable water supply and the development of new industries, economic impacts associated with

the development of new industries resulting from this Project have not been evaluated. The expansion of existing industries as a consequence of the improved water supply has also not been extensively evaluated; however, it is anticipated that numerous beneficial cumulative impacts similar to those described for the Proposed Action (see Section 4.5.3) would occur as a result of the Project.

Two long-term beneficial socioeconomic impacts would result from the implementation of the Project. First, access to good quality and a sufficient quantity of water by area residents would directly increase their quality of life and accommodate anticipated regional economic growth and development. Second, the potentially greater availability of surface water resulting from decreased demands on the water resource at various Project area locations would indirectly allow for alternative/increased use of existing surface water resources. Continued developmental planning by counties and communities would occur to accommodate anticipated regional population growth.

4.6 LAND USE

4.6.1 Impact Evaluation Criteria

Impacts to land use would be significant if Project activities and/or features precluded current land uses for the long term, permanently reduced agricultural productivity (i.e., farming, grazing), resulted in the long-term loss of recreational opportunities on the Missouri River, and/or permanently disrupted transportation activities (i.e., roads, railroads).

4.6.2 No Action Alternative

There would be no impacts from the No Action alternative because there would be no Project-required change in surface use.

4.6.3 The Proposed Action

Construction of Project facilities (i.e., well field, facilities, pump stations, treatment plant, reservoirs, service connection facilities) would permanently alter existing land use on approximately 236 acres. The majority of this land use change would occur on agricultural lands.

The loss of current land use on certain areas would occur. Land use impacts would include the short-term (i.e., during construction) and long-term (facility sites) loss of some areas from agricultural production. Short-term losses during construction would be mitigated through landowner compensation (i.e., System easement purchase and appropriate payment for lost crop revenues) and implementation of construction outside cropping periods, where practical. Long-term losses resulting at permanent facilities sites would be mitigated through land acquisition at fair market prices, and the avoidance of prime farmlands for facility sites, where practical. Impacts would also be tempered where practical by using appropriate soil segregation and replacement, implementing soil scarification or compaction as necessary, and using appropriate revegetation practices. Some mining opportunities may also be lost.

During pipeline construction, some area residents may experience traffic delays or property access problems. Additionally, snowmobile and hiking trails may be impacted at pipeline crossing locations. These short-term low-level impacts would be mitigated through prior notification of residents regarding work schedules, appropriate detour design in urban areas, and expeditious construction.

4.6.4 Mitigation

Where practical, wildlife production areas (e.g., federal waterfowl production areas) and actively mined areas would be avoided for all permanent facilities.

Topsoil would be segregated from subsoils during all construction operations requiring excavation. Segregated topsoil would be returned to the surface upon completion of operations

to facilitate successful revegetation and/or maintenance of predisturbance crop/vegetation productivity.

No additional mitigation measures beyond those desired in Section 2.2.2 are recommended.

4.6.5 Cumulative Impacts

Because most impacts to land use would be short term, they would not contribute to existing and reasonably foreseeable cumulative land use impacts.

4.7 VISUAL RESOURCES

4.7.1 Impact Evaluation Criteria

Impacts to visual resources would be significant if they result in permanent adverse effects to the Missouri River corridor.

4.7.2 No Action Alternative

Under the No Action alternative, there would be no project-related impacts to visual resources, and landscape visual resource characteristics would remain unchanged.

4.7.3 The Proposed Action

Factors determining the extent of the visual impacts associated with the Project would include changes in vegetative cover, the extent of natural screening of construction areas and permanent facilities, viewing distance, duration of construction activities, and Project effects on existing visible scenic (e.g., wooded) areas (most notably at the well field adjacent to the Missouri River).

Project-wide visual resource impacts would be greatest during Project construction; however, most of these impacts would be short term. Long-term visual impacts would occur at permanent facility sites and would be greatest for the proposed water treatment facility. Pipeline routes would primarily parallel existing roadways and, upon revegetation, would be virtually unnoticeable. The proposed treatment plant site is within an area of existing visual perturbation (farmed lands, houses, and other man-made features are present), and visual resource impacts from this facility (notably at Spirit Mound) are not anticipated. Visual resource impacts from the Missouri River associated with permanent well field features (pump houses) would be limited due to the application of the mitigation measures described in Section 2.2.2.

4.7.4 Mitigation

Visually important features (e.g., wooded areas) located within the Project area would be preserved by avoidance as deemed necessary during IERT reviews (see Appendix A). No additional mitigation measures other than those described in Section 2.2.2 are recommended. These measures include: avoidance of disturbance to most native grassland, wetland, and riparian areas and appropriate revegetation to reduce visual impacts (annually cultivated cropland would not be revegetated); minimization of construction area size; visual screening of permanent facilities utilizing natural topographic features or vegetation; landscaping permanent facility sites with trees, shrubs, and grasses; and designing permanent facility form and coloration to match that of surrounding areas.

4.7.5 Cumulative Impacts

Because most of the route would be constructed within or adjacent to existing linear disturbances and/or on currently farmed lands and fugitive dust would be controlled, Project impacts are not anticipated to notably contribute to regional cumulative visual impacts.

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5.0 RECORD OF PERSONS, GROUPS, AND GOVERNMENTAL AGENCIES CONTACTED

In addition to the provision of a listing of the persons, groups, and agencies contacted (Table 5.1), and a list of preparers (Table 5.2), the following text provides a summary of some of the consultation activities undertaken during the preparation of the EA.

U.S Fish and Wildlife Service. A pre-scoping meeting was held on February 6, 2001, with USFWS and the Departments of Natural Resources and Game, Fish, and Parks from South Dakota, Iowa, and Minnesota. The purpose of the meeting was to describe the Project; discuss federal- and state-listed species, and *Endangered Species Act* Section 7 Consultation and Coordination, including preparation of the BA; describe the IERT process; and identify *Fish and Wildlife Coordination Act* activities. A list of potentially occurring threatened, endangered, and candidate species was received from the USFWS on June 4, 2001.

Another meeting was held with the USFWS on April 1, 2002 to discuss the results of the BA prepared for the Project. The BA was submitted to the USFWS on April 29, 2002 (TRC Mariah 2002). The USFWS concurred with all BA determinations (see EA Appendix G, Section G.1).

National Park Service. Representatives from the National Park Service attended scoping meetings and informed Reclamation of the need to evaluate any potential impacts to the National Recreation River Segments of the Missouri River. A meeting was held with a representative from the National Park service on June 12, 2001, to discuss conducting this evaluation under Section 7 of the *Wild and Scenic Rivers Act*. The National Park Service reviewed the draft EA and determined that the Project would not have a violation of Section 7 (see EA Appendix G, Section G.13).

U.S. Army Corps of Engineers (COE). A scoping response letter was received from the COE, Planning, Programs and Project Management Division which outlined floodplain and *Clean Water Act* Section 404 requirements. Also, as a co-manager of the National Recreation River segments of the Missouri River, the COE was consulted during preparation of the draft EA.

Minnesota Department of Natural Resources (MDNR). Representatives from the MDNR attended the February 6, 2001, pre-scoping meeting. A list of state-listed species was received from the MDNR on June 21, 2001. They also provided information on rare natural communities and features. The MDNR provided comments on the draft EA, and a meeting was held on September 24, 2002, to discuss and clarify MDNR comments.

The discussion at the September 21, 2002, meeting focused on four key comment areas: 1) the function of the IERT and the need for a planning model for the Project; 2) T&E and state-listed species; 3) prairie remnants and other special habitats; and 4) inter-basin water transfer. This discussion and conclusions also have been incorporated into Section G.6 of this document. A brief summary of these comment areas follows.

The four components of the IERT planning model for the Project were discussed and are document in Section G.6, Comment Response 5, of this document. The purpose, organization, and function of the IERT was outlined by Reclamation. This team will provide assurance that all Project activities are completed in full compliance with all environmental commitments listed in the FONSI for the Project.

The T&E and state-listed species, prairie remnants, and other special habitats discussion focused on assuring that specific environmental commitments and previously lacking information on prairie remnants and state-listed species required by the MDNR was incorporated into the EA.

The inter-basin water transfer discussion clarified that the MDNR is concerned about the quantity of water entering the Heron Lake Watershed, not the inter-basin transfer of water. A discussion of the Heron Lake Watershed has been added to the final EA (see Sections 3.2.2.2 and 4.2.2.3).

Representatives from the MDNR indicated that if the IERT functioned as described in the meeting and if all required environmental commitments and analysis were incorporated into the

EA and implemented, the specific concerns identified in their letter would be adequately addressed and they would be supportive of a FONSI for the project.

State Historic Preservation Officers. Pre-scoping meetings were held with the State Historic Preservation Offices as follows: Iowa - February 1, 2001; South Dakota - February 16, 2001; and Minnesota - March 20, 2001. The purpose of these meetings was to discuss the Project; identify Reclamation and the System's roles in the cultural resource compliance process; identify any issues or concerns; and facilitate preparation of a cultural resources programmatic agreement.

The draft EA comment letter received from the Iowa SHPO expressed concerns about entering into the Programmatic Agreement (see Appendix E). The South Dakota and Minnesota SHPO offices and the Advisory Council on Historic Preservation have all found the Programmatic Agreement to be acceptable. Reclamation elected to implement the Programmatic Agreement without the participation of the Iowa SHPO. The protection and management of cultural resources in the Iowa portion of the Project area would be done in standard compliance with the NHPA Section 106 process. Reclamation would review and consult with the Iowa SHPO on each Project construction activity proposed in Iowa. However, the Iowa SHPO has reversed its decision as indicated in a December 2, 2002, letter to Reclamation. The Iowa SHPO is now interested in entering into a Programmatic Agreement with Reclamation. Reclamation will work with Iowa SHPO to either develop a separate Programmatic Agreement or to include them as a signatory on the existing Programmatic Agreement.

Indian Trust Assets. Scoping letters were sent to 14 tribal contacts. The Sac and Fox Nation responded with a designated contact for Project information. No other responses were received.

Table 5.1 Record of Persons, Groups, and Governmental Agencies Contacted.

Agency/Organization	Individual	Position
FEDERAL AGENCIES		
Advisory Council on Historic Preservation	Don Klima	--
U.S. Bureau of Reclamation	Maryanne Bach	Great Plains Regional Director
	Kimball Banks	Tribal consultation
	Dennis Breitzman	Area Manager
	Ted Hall	Civil Engineer
	Gerald Heiser	Natural Resource Specialist
	James Kangas	Area Archaeologist
	Richard Nelson	Supervisory Natural Resource Specialist
	Signe Snortland	Archaeologist
U.S. Department of Agriculture, Natural Resources Conservation Service	Faye Streier	Natural Resource Specialist, Team Leader
	Scott Osborn	--
U.S. Department of the Army, Corps of Engineers, Omaha, Nebraska	Brian Baker	Engineer
	Gail Campos	--
	Candace Gorton	Chief
	Becky Latka	--
	Steve Naylor	--
U.S. Fish and Wildlife Service (USFWS), Rock Island, Illinois	Richard C. Nelson	Supervisor
	Heidi Woeber	--
USFWS, Twin Cities Ecological Services Field Office, Minnesota	Phil Delphey	--
	Gary Wege	--
USFWS, Pierre, South Dakota	Pete Gober	Field Supervisor
	Scott Larson	Biologist
U.S. National Park Service (Missouri National Scenic Riverways)	Phil Campbell	--
	David Given	--
	Paul Hendren	--
	Wayne Werkmeister	--
NATIVE AMERICAN TRIBES		
Blackhawk Community	--	Tribal Chairman

Table 5.1 (Continued)

Agency/Organization	Individual	Position
Cheyenne River Sioux Tribe	Gregg Bouland	Chairman
Crow Creek Sioux Tribe	Roxanne Sazue	Chairwoman
Flandreau Santee Sioux	Thomas Ranfranz	President
Lower Brule Sioux Tribe	Michael Jandreau	Chairman
Lower Sioux Indian Community of Minnesota	Roger Prescott	President
Oglala Sioux Tribe	John Yellowbird Steele	President
Omaha Tribe of Nebraska and Iowa	Elmer Black Bird	Chairman
Otoe-Missouria Tribe	James Grant	Chairman
Ponca Tribe of Nebraska	Fred LeRoy	Chairman
Prairie Island Indian Community of Minnesota	Audrey Kohnen	President
Rosebud Sioux Tribe	William Kindle	President
Sac and Fox Tribe of the Mississippi in Iowa	Talbert Davenport	Chairman
Sac and Fox Nation of Missouri	Deanne Bahr	NAGPRA Contact Representative
	Sandra Keo	Tribal Chairwoman
Santee Sioux Tribal Council	Roger Trudell	Chairman
Shakopee Mdewakanton Sioux Community of Minnesota	Stanley Crooks	Chairman
Sisseton-Wahpeton Sioux	Andrew Grey	Chairman
Standing Rock Sioux Tribe	Charles Murphy	Chairman
Upper Sioux Community of Minnesota	Dallas Ross	Chairman
Winnebago Tribe of Nebraska	John Blackhawk	Chairman
Yankton Sioux Tribe	Madonna Archambeau	Chairwoman

Table 5.1 (Continued)

Agency/Organization	Individual	Position
IOWA		
Iowa Department of Natural Resources (IDNR)	Mike Anderson	--
	Keith Dohrmann	Environmental Specialist and Data Manager
	Doug Harr	Biologist
	John Pearson	--
	Steve Pennington	--
IDNR, Air Quality Bureau	Karen Coon	--
	Gary Smith	--
IDNR, Parks, Recreation and Preservation Division	Chris Schwake	--
	Arnold Sohn	--
	Wayne Wiksell	--
	Michelle Wilson	--
IDNR, Wastewater Permit Section	Ruth Rosdail	--
	Steve Williams	--
IDNR, Water Permit Branch	Mike Anderson	--
IDNR, Water Supply Section	Roy Ney	--
	Mike Wiemann	--
Iowa Department of Transportation	Brent Klaahsen	Maintenance Operations Assistant
	James Rost	Director
Iowa State Historic Preservation	Bret Giesler	--
	Daniel Higginbottom	Archaeologist
	Douglas Jones	--
	Lowell Soike	Deputy State Historic Preservation Officer
MINNESOTA		
Minnesota Department of Natural Resources (MDNR)	Rich Baker	--
	Naoko Meyer	--
	Victoria Poage	Regional Environmental Assessment Ecologist
	Jim Sehl	--

Table 5.1 (Continued)

Agency/Organization	Individual	Position
	Ken Wald	--
MDNR, Division of Lands and Minerals	Jean Zoch	--
MDNR, Natural Heritage and Nongame Program	Sarah Hoffman	Environmental Review Coordinator/ Ecologist
MDNR, Water Appropriation Permit Program	Jim Japs	--
Minnesota Pollution Control Agency	Gordon Anderson	--
	Peggy Bartz	--
	Keith Cherryhome	--
	Marilyn Hegwart	--
	Charlotte Morrison	--
Minnesota State Historic Preservation Office	Scott Anfinson	Archaeologist
	Britta Bloomberg	Deputy State Historic Preservation Officer
	Mark Dudzik	State Archaeologist
Noble County Environmental Services	Judy Peterson	--
Rock County Environmental Services, Land Management Office	John Burgers	--
SOUTH DAKOTA		
South Dakota Department of Environment and Natural Resources (SDDENR), Surface Discharge Program	Kelli Buscher	Engineering Director
	Stacy Reed	Natural Resources Engineer
	Al Spangler	Pretreatment Coordinator
SDDENR, Water Rights Program	Genny McMath	Environmental Scientist
SDDENR, Air Quality Program	Brian Gustafson	Natural Resources Engineer
	Kyrik Rombough	Engineering Specialist
	Brad Schultz	Senior Scientist
SDDENR, Ground Water Quality Program	Sheldon Hamann	Senior Hydrologist
SDDENR, Surface Water Quality Program	John Miller	Environmental Program Specialist
	David Ryan	Water Specialist
	Mitchel Williams	

Table 5.1 (Continued)

Agency/Organization	Individual	Position
SDDENR, Division of Water Rights	Eric Gronlund	Natural Resources Engineer
SDDENR, Solid Waste/Hazardous Waste Program	Vonnie Kallenmeyer	
South Dakota Department of Game, Fish, and Parks	Doug Backlund	Resource Biologist
	John Kirk	Senior Biologist
	Dave McGuigan	--
South Dakota Department of Transportation	Greg Alberg	Engineer
	James Nelson	Environmental Engineer
	Ron Peterson	Engineer
South Dakota State Historical Preservation Office	Jim Haug	State Archaeologist
	Steve Littlefield	Review and Compliance Officer
	Jay Vogt	State Historic Preservation Officer
Clay County Building and Zoning	Dave Waherry	--
Lake County Building and Zoning	Deb Reinickle	--
Lake County Highway Department	Scott Mathison	Superintendent
Lincoln County Building and Zoning	Alisa Van Bockern	--
Lincoln County Highway Department	Mary Romereim	--
Minnehaha County Building and Zoning	Dave Queal	Zoning Administer
Minnehaha County Highway Department	Bob Meister	Highway Superintendent
Turner County Building and Zoning	Bob Luke	--
Union County Building and Zoning	Dennis Henzey	--
City of Vermillion	Phyllis Packard	Solid Waste Director City of Vermillion
PRIVATE ENTITIES		
Banner Associates, Inc.	Tim Conner	Engineer
	Dave Odens	Engineer
Dickinson County News	Paul Wahl	--
Dorsey & Whitney	B. Andrew Brown	Attorney
	Jay Cook	Attorney
Earth Science Information Office	Dennis Swartwout	--

Table 5.1 (Continued)

Agency/Organization	Individual	Position
PRIVATE ENTITIES (cont.)		
HDR Engineering	Bill Brinker	Engineer
	Glenn Dostal	Engineer
KVHT Radio	Kevin Culhane	--
Layne Geosciences	Kathryn Epp	Hydrogeologist
Plain Talk	Dave Lias	--
Public Meeting Attendees	Red Arndt	--
	Al Erickson	--
	Gene Den Hartog	--
	Vern Hasenbank	--
	Harold Holoch	--
	Murray Hulstein	--
	Frank Luepke	--
	Diane Odens	--
	Scott Osborn	--
	Mark Postma	--
	Eldor Schuerman	--
	Kevin Smith	--
	Jean Still	--
	Derrick Vander Waal	--
Kevin Welsh	--	
Staubach	Toni Gaiser	--
The Stratton Group, Inc.	Randy Stratton	--

Table 5.2 List of Preparers.

Firm/Company	Name	Responsibility
Bureau of Reclamation, Dakotas Area Office, Rapid City, South Dakota	Gerald Heiser	Natural Resource Specialist
	Jim Kangas	Cultural Resources, Programmatic Agreement
	Faye Streier	Natural Resource Specialist, Team Leader
Bureau of Reclamation, Pierre Field Office, Pierre, South Dakota	Ted Hall	Civil Engineer
Lewis and Clark Rural Water Supply, Sioux Falls, South Dakota	Pam Bonrud	Executive Director
TRC Mariah Associates Inc., Laramie, Wyoming	S.L. Tiger Adolf	Attorney, Socioeconomics, Technical Editor, Document Production
	Genial DeCastro	Document Production, Quality Control
	Susan Eatinger	Air Quality
	Peter Guernsey	Project Management, Scoping, Quality Assurance
	Jan K. Hart	Document Preparation, Biology, Water
	Darek Huebner	EA Preparation, Wetlands
	Tamara Keefe	GIS database
	Tamara Linse	Technical Editor
	Suzanne Luhr	Cartography
	Steven Rehbaum	GIS database
	Russell Richards	Cultural Resources
Ed Schneider	Cultural Resources, Scoping	
Roger Schoumacher	Quality Assurance	

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