ES.0 Summary

In May 2006, Western Area Power Administration (Western), Rural Utilities Service (RUS), and U.S. Army Corps of Engineers (USACE) issued the Big Stone II Power Plant and Transmission Project Draft Environmental Impact Statement (Draft EIS, DOE/EIS-0377). The Draft EIS described the details of constructing and operating a nominal 600-megawatt (MW), coal-fired, baseload electric generating facility and associated transmission line and substation upgrades, known as the Big Stone II Project (proposed Project).

The proposed Project would be constructed by Otter Tail Corporation (dba Otter Tail Power Company (OTP)), Central Minnesota Municipal Power Agency, Great River Energy, Heartland Consumers Power District, Montana-Dakota Utilities Co., Southern Minnesota Municipal Power Agency, and Western Minnesota Municipal Power Agency (dba Missouri River Energy Services (MRES)), collectively referred to as the Co-owners. The proposed Big Stone II plant would be located adjacent to the existing Big Stone plant in Grant County, South Dakota, about eight miles northeast of Milbank and two miles northwest of Big Stone City, South Dakota.

Approval of the interconnection of the proposed Project to Western's electric utility grid requires compliance with the National Environmental Policy Act (NEPA, 42 United States Code § 4321 et sec (1969)) and the preparation of an EIS. NEPA regulations require that a supplement to a draft environmental impact statement be prepared if there are substantial changes to the Proposed Action or significant new circumstances or information relevant to environmental concerns, that contribute to the impacts of the Proposed Action.

After receiving new cost information for the construction of the proposed make-up water storage pond and reviewing comments on the Draft EIS concerning wetland impacts from construction of the proposed make-up water storage pond, the Co-owners made changes to the proposed Project. The Co-owners have proposed other changes including the source for the proposed plant water supply, plant cooling system, plant water usage, water treatment, and wastewater management. The Revised Proposed Action includes a wet cooling system using surface water as the primary water supply and groundwater as the back-up water supply. Changes also include installation of groundwater wells, a pipeline system to convey groundwater to the proposed plant site, and construction of electrical distribution lines to power the groundwater well pumps. There are no changes to the proposed Project's transmission alternatives.

Western determined that the use of groundwater as the back-up water supply would significantly change the environmental impacts of the proposed Project as presented in the Draft EIS and requires the preparation of a Supplemental Draft EIS. The change in the net capacity from 600 MW to 630 MW would not significantly change the environmental impacts of the proposed Big Stone II plant as presented in the Draft EIS. The purpose of this Supplemental Draft EIS is to present and analyze the environmental impacts of revisions to the proposed action presented in the Draft EIS. The Supplemental Draft EIS also analyzes alternative cooling system technologies for the proposed Project that use groundwater instead of surface water for the proposed Big Stone II power plant's back-up water supply.

ES.1 Purpose and Need for Agency Action

Western and cooperating agencies have a mandate to ensure that their actions comply with NEPA. Preparation of an EIS provides the framework for the agency decision-making processes. There have been no changes to the discussion of purpose and need of Western and the cooperating agencies as described by Section ES.1 of the Draft EIS.

ES.2 Applicant's Purpose and Need

There have been no changes to the discussion of the applicant's purpose and need, as described in Section ES.2 of the Draft EIS.

ES.3 Revised Proposed Action

The Co-owners have proposed changes to the Proposed Action that include changes to the plant water supply, plant cooling system, plant water usage, water treatment, and wastewater management. The Revised Proposed Action includes a wet cooling system using surface water as the primary water supply and groundwater as the back-up water supply. Changes to the Proposed Action also include installation of groundwater wells and a pipeline system to convey groundwater to the proposed plant site and construction of a new water pretreatment building. The significant changes also include elimination of the approximately 450-acre make-up water storage pond, elimination of the approximately 25-acre cooling tower blowdown pond, elimination of a new brine concentrator, and relocation of the cooling tower proposed in the Draft EIS.

ES.3.1 Changes to the Plant Water Supply

The proposed changes would eliminate the 450-acre surface water pond and use groundwater for the back-up water supply. The proposed plant would still use Big Stone Lake as the primary water supply source. The proposed use of groundwater would require the Co-owners to operate under a water appropriations permit from the South Dakota Department of Environment and Natural Resources (SDDENR). Groundwater from the Veblen Aquifer is proposed for the proposed plant's back-up water supply. Approximately 7 to 14 wells would be needed to supply the proposed Big Stone II plant with adequate make-up water. The proposed wells would be located on the proposed plant site or within an area approximately two to six miles west and southwest of the proposed plant site.

A pipeline system would be required to convey the groundwater from the production wells to the proposed plant. The pipeline system, with a linear requirement of up to 80,000 feet (approximately 15 miles), is proposed to be installed along existing road rights of way.

ES.3.2 Changes to the Plant Cooling System

Proposed changes would eliminate the 25-acre cooling tower blowdown pond that was proposed in the Draft EIS, and the cooling tower would be moved 3,600 feet to the east. No other change to the plant's cooling tower system is proposed by the Co-owners. Two of the alternatives considered dry cooling as a supplemental or sole heat transfer mechanism to cool process water for the proposed Big Stone II plant.

ES.3.3 Changes to Plant Water Usage

Operation of the proposed Big Stone II plant would require an additional 8,800 acre-feet per year (afy) (up from 7,500 afy in the Draft EIS). The total combined water consumption would be about 13,000 afy for both the existing Big Stone plant and proposed Big Stone II plant, using a wet cooling tower system for the proposed Big Stone II plant as proposed in the Revised Proposed Action. Based on the current water use model estimates (and anticipated permit restrictions for Big Stone Lake), approximately 3,720 afy of groundwater would be needed annually (on average) to supplement combined plant water needs. On occasion (e.g., during extreme drought), when groundwater is the sole source of water supply, the maximum annual groundwater appropriation required to operate both plants at full output would be 10,000 acre feet (af), at a pumping rate of about 6,200 gallons per minute (gpm).

ES.3.4 Changes in Water Treatment

Groundwater would be pretreated in a proposed new softening process that would reduce scaling and cooling tower blowdown wastewater. Softened water would be fed to a new filtration and reverse osmosis (RO) unit serving both the existing and proposed Big Stone II plants, which would remove approximately 98 percent of the dissolved solids. Wastewater and solids from the softening process would be reused in the Wet Flue Gas Desulfurization (WFGD) system or disposed in the on-site landfill.

The original design proposed in the Draft EIS included a 25-acre cooling tower blowdown pond, which is no longer included in the design. Cooling tower blowdown water would now be directed to the common WFGD system for reuse. The WFGD wastewater remaining after the solids have settled in the existing plant's brine sludge pond would be routed to a new pond for natural evaporation. This proposed new WFGD blowdown pond would be constructed by lining 70 acres of the existing 140-acre evaporation pond at the existing plant.

ES.3.5 Changes in Wastewater Management

The Revised Proposed Action requires that the existing holding pond, a portion of the existing evaporation pond, and the existing brine concentrator remain as wastewater treatment facilities. However, it is not anticipated that a new brine concentrator (as proposed in the Draft EIS) would be needed in proposed plant operation, and would not be constructed; therefore, the cooling tower blowdown pond, and the brine concentrator are no longer included in the design. No changes to the Proposed Action are being considered for the zero liquid discharge system.

ES.4 Alternatives Considered

Several alternatives were analyzed in the Supplemental Draft EIS. Alternative 1 was described in the Draft EIS. Alternatives 2, 3, and 4 propose to use groundwater as the back-up water supply, with different cooling system technologies, respectively. All alternatives use surface water from Big Stone Lake as the primary water source for cooling. Analysis of the proposed Project's primary water source was included in the Draft EIS. Back-up water would be used in the event of a drought, when sufficient quantities of water could not be pumped from Big Stone Lake.

An alternative analysis was conducted which compared the alternatives using operating, economic, and environmental screening criteria. Comparisons of operating criteria considered net power output, efficiency improvement, and auxiliary power uses. Economic criteria included capital and operating costs differences. Environmental criteria included comparisons of water consumption, air emissions, land use, and impact to wetlands. Alternatives studied in this Supplemental Draft EIS include:

- Alternative 1: Wet cooling using surface water as the back-up water supply. This alternative was previously analyzed in the Draft EIS. Alternative 1 was eliminated due to the highest capital costs of the alternatives and higher environmental impacts.
- Alternative 2: Wet cooling using groundwater as the back-up water supply. Alternative 2 has the lowest capital costs, the lowest environmental impacts, and the highest plant efficiency of the alternatives. Alternative 2 was selected as the Revised Proposed Action.
- Alternative 3: Wet/Dry cooling using groundwater as the back-up water supply. Alternative 3 has significantly higher capital costs than Alternative 2. Alternative 3 also has higher environmental impacts than Alternative 2, but has the lowest efficiency of the alternatives. Alternative 3 was carried forward for additional analysis.
- Alternative 4: Dry cooling using groundwater as the back-up water supply. Alternative 4 was eliminated due to higher capital costs and environmental impacts.

ES.5 No Action Alternative

There are no changes to the discussion of the No Action Alternative as described in Section ES.5 of the Draft EIS.

ES.6 Impacts

The Supplemental Draft EIS addresses the impacts of changes to the proposed Project relative to cooling alternatives and the use of groundwater as the back-up water source. Table ES-1 presents a summary of the environmental impacts of constructing and operating the proposed power plant. New impacts from the changes to the proposed Project have been bolded in Table ES-1. Impacts from the Draft EIS that are no longer applicable to the proposed Project are shown in the table as strikethroughs. Environmental impacts for the transmission portions of the proposed Project are addressed in the Draft EIS.

The standard mitigation measures (SMM) to reduce impacts of the changes to the proposed Project are provided in Chapter 2, Table 2.2-1. Actions incorporated into the Revised Proposed Action and the standard mitigation measures would lessen impacts; however, some adverse impacts from the proposed action would remain. Additional mitigation measures are identified to further lessen environmental impacts to specific resources. The Federal agencies would determine the appropriate mitigation measures with issuance of the record of decision.

Table ES-1. Summary of Impacts

Resource	Revised Proposed Action Alternative 2 – Wet Cooling with Groundwater Supply Back-Up	Alternative 3 – Wet/Dry Cooling with Groundwater Supply Back-Up	No Action Alternative
Air Quality	▪ **Projected carbon dioxide emissions from the proposed plant would be approximately 0.15 percent less than the Proposed Action described in the Draft EIS and would average approximately 4.7 million tons/year.**	▪ **Projected carbon dioxide emissions would be 2.28 percent higher than the Revised Proposed Action and would average approximately 4.8 million tons/year.**	▪ The existing Big Stone Plant would continue to operate in accordance with its current air permit. ▪ There would be no reduction in mercury, SO_2, or NO_X, emissions for the existing Big Stone Plant.
	▪ Short-term construction impacts resulting from vehicle emissions and dust would be less than significant. ▪ No increase in sulfur dioxide (SO_2) and oxides of nitrogen (NO_X) emissions increases would occur over the existing Big Stone plant emissions. ▪ Mercury emissions from coal combustion would comply with the Clean Air Mercury Rule (CAMR) and would be less than or equal to historic levels from Year 1994. ▪ ~~Projected carbon dioxide (CO2) emissions from the proposed plant would average approximately 4.7 million tons/year~~. ▪ Impacts upon views of Class I areas from proposed plant emissions would be less than significant. ▪ Projected total emissions of all hazardous air pollutants from the existing and proposed plants would be reduced by approximately 41 tons/year (from approximately 63 tons/year by the existing plant to approximately 22 tons/year by the combined existing and proposed plant operations). ▪ The proposed Big Stone II plant would operate under an air emission permit from the South Dakota Department of Environmental and Natural Resources (SDDENR) and would comply with National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) increments. Any short-term and long-term residual impacts would meet regulatory requirements and would be less than significant.		
Groundwater Resources	▪ **Up to 14 permanent wells would be constructed in the groundwater areas. Average annual groundwater production would be approximately 3,720 af.**	▪ **Up to 14 permanent wells would be constructed in the groundwater areas. Average annual groundwater production would be approximately 2,036 af.**	▪ Use of groundwater resources during construction **or operation** would not occur.
	▪ ~~Although a short-term groundwater supply may be needed during construction, these limited construction demands would have less than significant impacts on groundwater supplies.~~ ▪ ~~The proposed plant would not use groundwater during operations.~~ ▪ ~~The cooling tower blowdown pond would be constructed with an engineered liner and monitored by a system of groundwater monitoring wells, minimizing impacts to groundwater.~~		

Table ES-1. Summary of Impacts

Resource	Revised Proposed Action Alternative 2 – Wet Cooling with Groundwater Supply Back-Up	Alternative 3 – Wet/Dry Cooling with Groundwater Supply Back-Up	No Action Alternative
	~~▪ Impacts to groundwater from constructing and operating the proposed plant would be less than significant.~~ ▪ **Groundwater pumping from the Veblen Aquifer would not cause significant impacts to beneficial uses of the aquifer.** ▪ **Impacts to groundwater from construction of the wells and pipeline facilities would be less than significant.**		
Floodplains	▪ Small isolated flood hazard zones at the proposed plant site would be lost due to construction activities. ▪ Construction and operation of the proposed plant facilities would not constrict or modify flow conveyances, or measurably add to flood flows. ▪ Impacts to floodplains from construction or operation of the proposed plant, **groundwater wells, and pipelines** would be less than significant.		▪ Impacts to floodplains and isolated flood hazard zones would not occur.
Surface Water Resources	▪ **The existing plant and proposed Big Stone II plant combined annual consumptive water use would be about 13,000 af, which includes an annual average surface water appropriation of about 9,300 af from Big Stone Lake and an average annual groundwater appropriation of about 3,700 af.** ▪ **Big Stone Lake elevation would decrease by 0.15 feet on average. The most significant impact would be a lake elevation reduction of 0.83 feet in two non-consecutive weeks.** ▪ **Minor episodic decreases in base flow to the Whetstone River would occur due to groundwater pumping. However, the pumping would not cause a substantial extension in the period of naturally occurring seasonal reduction of flow in surface water that results in insufficient quantities of water for downstream users. These impacts would be less than significant.**	▪ **The existing plant and proposed Big Stone II plant combined annual consumptive water use would be about 7,300 af, which includes an average annual groundwater appropriation of about 2,036 af.** ▪ **Big Stone Lake elevation would decrease by 0.14 feet on average. The most significant impact would be a lake elevation reduction of 0.58 feet in two non-consecutive weeks.** ▪ **The impacts to surface water from operation of the groundwater wells would be less than those described in the Revised Proposed Action, since less water would be required.**	▪ Withdrawals from Big Stone Lake would continue at current levels. ▪ Existing water features would not be impacted.

Table ES-1. Summary of Impacts

Resource	Revised Proposed Action Alternative 2 – Wet Cooling with Groundwater Supply Back-Up	Alternative 3 – Wet/Dry Cooling with Groundwater Supply Back-Up	No Action Alternative
	▪ Short-term runoff and erosion impacts would occur during construction. ▪ Drainage configuration and watershed features at the proposed plant site would be rerouted around project features or changed. ~~Creation of a make-up water storage pond would remove 0.8 square miles of contributing watershed area.~~ ▪ ~~The proposed plant would require an additional 7,500 acre-feet per year of fresh water from Big Stone Lake. Increased surface water withdrawals from Big Stone Lake could lower the lake level by 1.0 feet during one year out of 70 years of operation. On average over a 70-year period, lake levels would decrease between 0.1 and 0.2 feet.~~ ▪ Due to varying river and lake conditions and the possibility of storage withdrawals at other times, reductions in flow releases from Big Stone Lake would be expected, but would be infrequent. ▪ ~~Evaporative water losses related to plant cooling would increase by 1,350 afy.~~ ▪ Impacts of acid rain, mercury, and nitrogen contribution to area lakes are expected to be less than significant. ▪ Impacts to surface water resources from constructing or operating the proposed plant would be less than significant.		
Geology and Minerals	▪ No unique geologic features are located within the proposed project area. Potential geologic hazards such as seismicity, landslides, and sinkhole development associated with karst formation are not present within the proposed project area. Therefore, there would be no significant impacts to unique geological features or impacts associated with geologic hazards as a result of construction or operation of the proposed plant. ▪ Mineral resources would not be precluded from development. Therefore, there would be no significant impacts to mineral resources from constructing or operating of the proposed plant.		▪ Impacts to commercial minerals mining would not occur.
Paleontological Resources	▪ Paleontological resources are either not exposed or do not exist beneath surficial glacial deposits at the proposed plant site. There would be no significant impacts to paleontological resources from the construction or operation of the proposed plant.		▪ Potential paleontological resources would remain undisturbed and undiscovered.
Soils	▪ ~~Approximately~~ **150.1** ~~80~~ acres of soils would be temporarily disturbed during construction activities. ▪ Project components would disturb a total of **189.4** ~~612~~ acres of soils, of which **2.4** ~~414~~ acres would be permanently removed from potential agricultural use. ▪ The long-term loss of soils would not be a significant impact, due to the stockpiling of topsoil and the extensive similar resources present in the vicinity of the proposed plant.		▪ Soil disturbance would not occur, and agricultural acreage would not be lost.
Vegetation Resources	▪ Following implementation of standard and additional mitigation measures, no significant impacts to rare plants, native plant communities, or other sensitive features identified by a State or Federal resource agency are expected as a result of		▪ Vegetation losses would not occur.

Table ES-1. Summary of Impacts

Resource	Revised Proposed Action Alternative 2 – Wet Cooling with Groundwater Supply Back-Up	Alternative 3 – Wet/Dry Cooling with Groundwater Supply Back-Up	No Action Alternative
	construction and operation activities. Residual impacts would include the long-term net loss of approximately **4.4** ~~96.4~~ acres of ~~wetland-riparian,~~ forest and prairie type vegetation. **There would be no losses of wetland/riparian areas.** ▪ Mitigation measures would be implemented to prevent the introduction and spread of noxious weeds.		▪ Project-related introduction of invasive and noxious weeds would not occur.
Wildlife	▪ Direct impacts to wildlife would include limited direct mortality from construction activities, habitat loss, alteration or fragmentation, animal displacement, and disturbance of breeding, nesting, and foraging habitat for small game and birds. These impacts would not be sufficient to cause a species to become listed or proposed for listing as threatened or endangered. Since species compatible with the existing use would likely be compatible with the proposed use, there would not be a significant long-term impact to wildlife due to habitat alteration. ▪ Residual impacts would include the long-term net loss of approximately **39.3** ~~532~~ acres of wildlife habitat.		▪ Loss of wildlife habitat would not occur.
Fisheries	▪ There would not be a loss of a population of aquatic species that would result in the species being listed or proposed for listing as threatened or endangered. Water intake would not result in a significant impact on fish populations. ▪ No long-term impacts to fisheries are expected.		▪ No impacts to fish habitat would occur.
Special Status Species	▪ Habitat for special status species has been identified on the proposed plant site; **however, no individuals were present during surveys.** ▪ Impacts to special status plants would include the long-term net loss of approximately **4.4** ~~96.4~~ acres of suitable special status plant species habitat (~~wetlands,~~ prairie and forest). Following the implementation of standard and additional mitigation measures, no significant residual impacts to special status plant species are expected as a result of construction and operational activities. ▪ Sixteen terrestrial wildlife species (six special status species and 10 species of concern) may occur within the proposed plant site. Direct impacts from constructing and operating of the proposed plant would include the loss or alteration of breeding and foraging habitats and increased habitat fragmentation. Mortality could also occur to less mobile or burrowing species. Abandonment of a nest site and the loss of eggs and/or young may also occur. ▪ ~~Direct impacts to the northern river otter could result from a long-term loss of approximately 65 acres of wetland/riparian habitat within the proposed plant site.~~ ▪ One Federal special status bird species, the bald eagle, is known to occur in the vicinity of the proposed plant site. **With elimination of the 450-acre make-up water storage pond, there would be no direct impacts to bald eagle foraging habitat, since there would be no loss of wetland/riparian areas.** ~~Direct impacts to bald eagle foraging habitat would result in a long-term loss of approximately 65 acres of foraging habitat (i.e., wetland/riparian areas) within the proposed plant site, but foraging habitat would be created or enhanced in other locales to offset habitat losses.~~ ▪ No federally-listed aquatic species or designated critical habitat occur in water bodies within or downstream of the		▪ No impacts to special status species would occur.

Table ES-1. Summary of Impacts

Resource	Revised Proposed Action Alternative 2 – Wet Cooling with Groundwater Supply Back-Up	Alternative 3 – Wet/Dry Cooling with Groundwater Supply Back-Up	No Action Alternative
	proposed plant site. ▪ **Special status species that use the Whetstone River would not be adversely affected by minor episodic flow reductions caused by groundwater pumping.** ▪ None of the anticipated impacts to special status species would result in an unpermitted violation of statutes or regulations pertaining to special status fish or mussel species. No impacts to special status fish and mussel species would occur. ▪ Western would complete Endangered Species Act (ESA) Section 7 consultation prior to initiating construction activities and any reasonable and prudent measures issued by the (U.S. Fish and Wildlife Service (USFWS) in its Biological Opinion would be adhered to by Western and the Co-owners.		
Wetlands	▪ **No long-term losses of wetlands are anticipated. Short-term impacts could occur; however, these impacts would be mitigated under a nationwide permit or a Section 404 permit issued by the USACE. Impacts to non-jurisdictional wetlands would be mitigated in accordance with applicable State or Federal requirements.** ▪ ~~Construction would result in the loss of 65 acres of wetland/riparian areas. A significant impact would not occur as a result of any loss or degradation of any jurisdictional wetland, since these impacts would be mitigated under a Section 404 permit issued by the U.S. Army Corps of Engineers (USACE). Impacts to non-jurisdictional wetlands are also included in the Section 404 permit. Residual impacts would include the long-term net loss of 65 acres of wetland/riparian areas.~~		▪ No indirect loss of wetlands would occur.
Archaeological Resources Historical Resources	▪ It is anticipated that by following the procedures outlined in Section 106 of the National Historic Preservation Act (NHPA) and the Programmatic Agreement (PA), adverse impacts to archaeological and historic resources eligible for inclusion to the National Register of Historic Places (NRHP) would be avoided or mitigated. Unavoidable impacts to NRHP-eligible sites would be mitigated through implementation of a treatment plan in accordance with the PA. ▪ Impacts to NRHP-eligible sites would not be significant with implementation of the PA and standard mitigation measures. ▪ **Any traditional cultural properties (TCP) identified within the proposed Project area would receive the appropriate level of protection or recovery by implementing mitigation measures, treatment plans, or compliance actions (e.g., protection of burial sites) in accordance with the PA. Impacts to these resources would not be significant with implementation of the PA.**		▪ Potential archaeological resources would remain undisturbed and undiscovered. ▪ No cultural or historical resources would be affected

Table ES-1. Summary of Impacts

Resource	Revised Proposed Action Alternative 2 – Wet Cooling with Groundwater Supply Back-Up	Alternative 3 – Wet/Dry Cooling with Groundwater Supply Back-Up	No Action Alternative
Native American Concerns	**Note: Native American concerns have been combined with archaeological and historical resources.** ▪ ~~Any traditional cultural property (TCP) identified within the project area would receive the appropriate level of protection or recovery by implementing mitigation measures, treatment plans or compliance actions (e.g., protection of burial sites) in accordance with the proposed PA. Impacts to these resources would not be significant with implementing the proposed PA.~~		▪ ~~Cultural environmental conditions and trends would continue.~~
Land Use Resources	▪ The proposed plant would require various permits, land use approvals, or zoning changes for construction and operation. With approval of zoning changes, there would be no conflicts with land use plans, zoning, or with special use areas. ▪ Increased growth and temporary increase in workforce would not overburden existing recreation resources nor would air pollutant emissions reduce recreational opportunities. No significant impacts from the construction and operation of the proposed plant are anticipated in terms of increased demand for recreation. ▪ Total new land required for construction of the proposed plant would be **189.4** ~~612~~ acres, of which **150.1** ~~80~~ acres is a short-term impact due to construction. ▪ Total long-term impacts to land use from the proposed power plant construction and operation would be **39.3** ~~532~~ acres.		▪ Zoning changes would not be needed. ▪ No changes in existing land uses or recreation use. Land use and recreation use trends would continue.
Agricultural Practices	▪ The permanent conversion of **2.1** ~~328~~ acres of prime farmland for the proposed plant would be a long-term and residual impact. This amount is only a small portion of the prime farmland in Grant County, and there would be no adverse affect on agriculture in the region. Therefore, it would not be a significant impact to prime farmland in the region. ▪ No pivot irrigation facilities would be affected by constructing the proposed plant.		▪ No prime and unique farmlands would be lost. Current agricultural uses and trends would continue.
Public Facilities	▪ No public facilities would be affected by construction of the proposed plant.		▪ Current public facility conditions and trends would continue
Infrastructure, Public Health and Safety, and Waste Management	▪ Construction of the proposed plant would occur over four years and would require approximately 1,400 workers at the peak of construction, causing a short-term increase in daily traffic counts. ▪ The existing local roads and rail system would be able to handle the increase in road traffic and train numbers during operation of the existing plant and the proposed Big Stone II plant. Damage to roads due to construction activities would be repaired. ▪ Construction and operation of the proposed plant would not cause a significant impact to public health and safety. Implementing a facility health and safety plan would ensure there would be no interference with local emergency response capabilities or resources and prevent serious injuries to workers. Controlling access to the proposed plant facilities and construction sites would prevent injury to the public and local land users.		▪ Temporary impacts to traffic due to construction would not occur. ▪ Increased transport of hazardous materials for plant operations would not occur.

Table ES-1. Summary of Impacts

Resource	Revised Proposed Action Alternative 2 – Wet Cooling with Groundwater Supply Back-Up	Alternative 3 – Wet/Dry Cooling with Groundwater Supply Back-Up	No Action Alternative
	▪ Since no sensitive receptors or land use are located near the proposed plant site, there would be no impacts from electric and magnetic fields from the proposed plant. Because the plant is isolated, there would be no substantial interference or disruption of any emergency or health and safety communication system. ▪ By implementing standard and additional mitigation measures, impacts from hazardous materials and waste management during construction and operation of the proposed plant would not be significant. Disposal of wastes would be conducted following State and Federal regulations and would not impact public health. Procedures to control spills or releases of hazardous materials or regulated substances would be established in the Co-owners' health and safety program, and the program would not interfere with any locally adopted emergency or response plan. Impacts from hazardous materials and waste management activities for constructing and operating the proposed Big Stone II plant would be less than significant.		
Visual Resources	▪ Construction activities would result in temporary, short-term impacts from lighting. ▪ Constructing and operating the proposed plant would result in additive long-term low to moderate visual impacts due to addition of stack, power plant building, and coal silos. ▪ Additive sources of light or glare are expected as a result of operation of the proposed plant structures. ▪ Residual visual impacts would be less than significant due to the influence of the existing Big Stone plant.		▪ There would be no temporary or additive impacts due to lighting, glare, or additional structures.
Noise	▪ Noise levels would increase during construction of the proposed plant, but are considered to be short-term impacts. ▪ The addition of the proposed plant would result in a slightly noticeable increase over existing nighttime noise levels **that are** generated from the existing plant. There would be no incremental noise increases above 5 decibels on the A-weighted scale (dBA). **Minnesota residential noise standards may be exceeded at one residence due to increased construction traffic from construction traffic.** By implementing the additional mitigation measure for construction noise impacts to the nearest residence, this impact would be less than significant.		▪ There would be no increases in noise due to construction or operation of the plant.
Social and Economic Values, and Environmental Justice	▪ Short-term impacts on housing and public services would be significant. The direct and indirect economic benefits from construction costs to the surrounding four-county region and the State of South Dakota are a significant beneficial impact. The creation of temporary and permanent jobs in the community is also a beneficial impact. ▪ Based on the social and economic analysis, no significant short-term or long-term negative impacts are anticipated from uncompensated losses to existing businesses or residences, loss of economic viability of a farm or other business, permanent and irreversible loss of work for a major sector of the community, or the physical division of an established community. ▪ The poverty rate for the census tracts affected by the proposed plant site is 10.4 percent, while minorities comprise 1.2 percent of the population in the census block groups in which the proposed plant site is located. This poverty rate is less		▪ Impacts to local housing and community services would not occur. ▪ No economic benefit to the community from additional jobs or the additional taxes that would be paid by the proposed Project.

Table ES-1. Summary of Impacts

Resource	Revised Proposed Action Alternative 2 – Wet Cooling with Groundwater Supply Back-Up	Alternative 3 – Wet/Dry Cooling with Groundwater Supply Back-Up	No Action Alternative
	than the State of South Dakota's poverty rate of 13.2 percent and comparable to Grant County's poverty rate of 9.9 percent. The minority population for the affected area is lower than the State of South Dakota (11.3 percent) and comparable to Grant County (1.4 percent). The proposed plant would not have a disproportionate negative effect on minority or low-income populations in the area.		

Short-term effects from the proposed Project would primarily be related to construction activities. For the most part, these would be localized effects. No significant long-term adverse effects are expected from the changes to the proposed Project. In addition to a summary of impacts in Table ES-1, impacts to key resources areas affected by the changes to the proposed Project are summarized in the following paragraphs.

Air Quality

The Supplemental Draft EIS evaluated the impacts of the two cooling alternatives on air quality. Additionally, detailed design of the proposed Big Stone II power plant increased steam cycle efficiency, which resulted in a nominal increase of net capacity from 600 megawatts (MW) to 630 MW. A comparison of the efficiencies of the two compared alternatives shows that using a wet cooling system under the Revised Proposed Action would provide the most efficient process for generating electricity along with the least amount of air emissions. Although the air emissions would be less under the Revised Proposed Action, the Prevention of Significant Deterioration (PSD) Permit would still be applicable. With 0.15 percent lower air emissions for the Revised Proposed Action, there would be no significant change to the results of air modeling noted in Table 4.1-4 of the Draft EIS.

Water Resources

The proposed Big Stone II plant would typically require withdrawal of an additional 8,800 acre-feet-per-year (afy) (up from 7,500 afy in the Draft EIS) of fresh water to replace water losses due to evaporation in the power plant cooling system and the WFGD system. Under the Revised Proposed Action, the total combined water consumption would be about 13,000 afy for both the existing Big Stone plant and proposed Big Stone II plant. This is an increase of about 1,300 afy from the 11,700 afy stated in the Draft EIS. Surface water from Big Stone Lake is proposed as the primary source of make-up water for both the existing Big Stone plant and proposed Big Stone II plant. If water is unavailable from Big Stone Lake, such as withdrawal restrictions imposed by the permit, a back-up water source would be used for operation of the proposed plant. The changes to the proposed Project would eliminate the 450-acre make-up water storage pond and use groundwater for the back-up water supply. On average, the water requirement for both plants would be composed of about 9,300 afy from the Big Stone Lake and about 3,700 afy of groundwater from the Veblen Aquifer. OTP developed a surface-water model, based on historical climatological data and proposed plant water demand for a 70-year period with climatic conditions similar to the period between 1930 and 2000. Based on detailed modeling, surface water alone would not meet proposed water supply requirements in 66 out of 70 years. It is possible that groundwater would be the sole source of water supply under extreme drought conditions.

With the average proposed surface water supply requirements of 9,300 afy, the predicted impacts on Big Stone Lake, over a 70 year study period would cause the Big Stone Lake elevation to decrease by 0.15 feet (same as in the Draft EIS). The most significant impact would be that the lake would be 0.83 feet lower in two non-consecutive weeks out of a 70-year model period (compared to a one-foot reduction in the Draft EIS). The key issue with respect to water withdrawals from Big Stone Lake is the impact on low flows (less than 80 cubic feet per second (cfs)) in the Minnesota River below Big Stone Lake. Section 4.2.2.3 of the Draft EIS discusses these impacts. The water supply plan described in the Draft EIS and the proposed water supply plan under the Revised Proposed Action are nearly identical, and the impacts on the Minnesota River low flows are limited to less than two percent of the

low flow weeks modeled in the 70-year study period. This is because the surface water appropriations permit limits most lake appropriations to periods when the Minnesota River flows are relatively high (e.g., during spring runoff periods). The existing and proposed Big Stone II plants' combined surface water usage for the Revised Proposed Action would reduce flows out of Big Stone Lake into the Minnesota River, but these reductions would be less than significant.

Based on the current water use model estimates (and anticipated permit restrictions for Big Stone Lake), approximately 3,700 acre-feet of groundwater would be needed annually (on average) to supplement combined plant water needs. The Co-owners prepared a groundwater model to estimate the regional effects of future pumping from the proposed 7 to 14 wells that would be required to provide a back-up water supply for the proposed plant. The groundwater model demonstrated that groundwater demands for the proposed plant could be met from these 7 to 14 proposed wells. The modeling predicted the area and amount of maximum drawdown of the Veblen Aquifer due to groundwater pumping for the proposed Project for the entire period of model simulation (55 years). As shown by Chapter 4, Figure 4.2-3, the modeling predicts the greatest drawdown of the Veblen Aquifer would be approximately 37 feet. OTP, on behalf of the Co-owners, filed an application for a Water Appropriation Permit with SDDENR on March 28, 2007. The SDDENR independently evaluated the availability of groundwater from the Veblen Aquifer during their review of the Co-owners' Water Appropriation Permit Application. They prepared a report to the South Dakota Water Management Board recommending approval of the Co-owners' application. Based on SDDENR's evaluation, pumping of the aquifer in accordance with the permit would have no significant impacts to other beneficial uses of the aquifer.

Episodic decreases in base flow to the Whetstone River would occur due to proposed groundwater pumping. However, the pumping would not cause a significant extension in the period of naturally occurring seasonal reduction of flow in surface water that results in insufficient quantities of water for downstream users. These impacts would be less than significant.

Biological Resources

Additional investigation was completed by the Co-owners to determine whether groundwater pumping would have any impact to biological resources such as vegetation, wildlife, fisheries, special status species or wetland/riparian areas. These additional studies did not identify any evidence of significant impacts to these resource areas due to long-term pumping of the Veblen Aquifer. Western would consult with the U.S. Fish and Wildlife Service (USFWS) to comply with Section 7 of the Endangered Species Act for federally-listed and candidate species and species proposed for listing. Western would prepare a biological assessment to determine project effects on Federal species of concern. Section 7 consultation would be completed prior to start of construction activities, and any mitigation issued by the USFWS in its Biological Opinion, if needed, would be adhered to by the Co-owners.