4.0 AFFECTED ENVIRONMENT AND THE ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

4.1 APPROACH

Section 4.0 is organized by resource, beginning with Section 4.3. The relevant aspects of the existing conditions for each resource are described followed by the potential consequences of the proposed action on that resource.

4.2 SITE DESCRIPTION

The site proposed for the Advanced Hybrid Particulate Collector (AHPC) is Otter Tail Power Company's steam-electric generating facility near Big Stone City, SD. The Big Stone Power Plant is located in Grant County, and the main plant building is located less than 2 miles northwest of Big Stone City, which borders the neighboring town of Ortonville, MN, resulting in a combined local population of about 2,800. State Highway 109 runs along the eastern side of the Power Plant.

The Big Stone Plant lies on a glacial drift plain that stands 140 feet above Big Stone Lake to the east and the Whetstone River to the south. To the west, the ground surface rises 900 feet within 15 to 20 miles to the crest of Coteau des Prairies, a prominent regional highland. Approximately 200 feet of glacial drift, comprised primarily of sandy, gravelly clay, underlies the site.

No wetlands, flora, or fauna would be affected by construction or operation, because the proposed activities would occur in an already disturbed, actively used, non-vegetated area. No archaeological or historic resources are located at the site of the proposed project. The nearest Class I area is over 300 kilometers from the Big Stone Plant.

The Northern Corn Growers Association of Milbank, SD, leases approximately 40 acres of the Big Stone Plant site for establishing an ethanol plant with a production capacity of 40,000,000 gallons per year. The Big Stone Power Plant would supply steam, water, rail access, electricity, and other services to the ethanol plant, which is scheduled to begin production in mid-2002. Changes potentially resulting from the proposed action would neither affect nor be affected by ethanol plant operations.

Otter Tail Power Company is also preparing a feasibility study to evaluate the potential need for a second power plant at the Big Stone City location. Installation of the AHPC would have no relationship to any decision on installation of a second power plant unit.

4.3 AESTHETICS AND VISUAL RESOURCES

4.3.1 Affected Environment

The tallest structure at the Power Plant is the boiler exhaust stack, which has a 42-ft diameter base and a 498-ft height. The largest plant building is the main boiler building, which has a footprint of 218 ft by 323 ft and a height of 295 ft. The electrostatic precipitator (ESP) building, which would be affected by the AHPC project and is located adjacent to the boiler building, has a footprint of 210-ft by 100-ft and a height of 75 ft.

All of the indicated structures are constructed of earth-tone colors to allow the Power Plant to blend with the environment.

4.3.2 Environmental Consequences

Construction Impacts

The main components of the AHPC would be constructed within the same dimensions as the existing ESP building. The only visible change would be addition of approximately 20 ft of ductwork above the AHPC. The additional ductwork would not cause a noticeable visual change, since it would be located next to the significantly larger boiler building.

Construction activities would be partially shielded by the existing boiler building, and would not be directly visible from Big Stone City.

Operation Impacts

Operation of the AHPC would not adversely affect the aesthetics of the area. Replacement of the existing ESP with the AHPC system would reduce or eliminate the frequency and magnitude of visible flue gas discharges caused by particulate releases from operation or maintenance of the ESP.

4.4 AIR QUALITY

The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for the following seven criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 micron size (PM_{10}), particulate matter less than 2.5 micron size ($PM_{2.5}$), and lead (Pb). NAAQS are expressed as concentrations of pollutants in ambient air (see insert).

National Ambient Air Quality Standards

Primary Standards establish the air quality level necessary to protect public health from known or anticipated adverse effects of a pollutant, allowing a margin of safety to protect sensitive members of the population. Secondary Standards establish the air quality level necessary to protect public welfare by preventing injury to agricultural crops and livestock, deterioration of materials and property, and adverse impacts on the environment.

Pollutant	Averaging Time	Standards[1]
Ozone	1 hr	235 $\mu g/m^3$
Carbon Monoxide	1 hr[3]	40 mg/m^3
	8 hr[3]	10 mg/m^3
Nitrogen Dioxide	Annual[2]	100 $\mu g/m^3$
Sulfur Oxides	Annual[3]	80 $\mu g/m^3$
	24 hr[3]	365 $\mu g/m^3$
	3 hr[4]	1300 $\mu g/m^3$
Suspended Particulate ($PM_{2.5}$)	Annual[2]	15 $\mu g/m^3$
	24 hr	65 $\mu g/m^3$
Suspended Particulate (PM_{10})	Annual[2]	50 $\mu g/m^3$
	24 hr	150 $\mu g/m^3$
Lead	¼ year	1.5 $\mu g/m^3$

[1] Primary and Secondary Standards are the same for all pollutants, except for sulfur oxides and carbon monoxide.
[2] Arithmetic mean
[3] Primary Standard
[4] Secondary Standard

Particulate matter is the only criteria pollutant that would be affected by the AHPC project. Although previous data have indicated that vapor-phase trace metals can be effectively captured with sorbents in the AHPC without impairing performance, sorbent development is not an objective of the AHPC demonstration.

The NAAQS standards for particulate matter apply to statistical values of air quality that are derived from 3 years of data. Sufficient air quality data are not yet available for evaluating compliance with the $PM_{2.5}$ standards.

For areas that are in attainment with NAAQS, EPA has established standards for Prevention of Significant Deterioration (PSD) of air quality (40 CFR, Part 51.166). The PSD standards provide maximum allowable increases in concentrations of pollutants for areas already in compliance with NAAQS and are expressed as allowable increments in the atmospheric concentrations of pollutants. Allowable PSD increments currently exist for SO_2, NO_2, and PM_{10}.

One set of allowable PSD increments exists for Class II areas, which include most of the United States, and a more stringent set of allowable increments exist for Class I areas, which are defined under the Clean Air Act (Title 42, United States Code, Part 7472, Section 162) as international parks, national parks that exceed 6,000 acres in size, or national wilderness areas or national memorial parks that exceed 5,000 acres in size. These PSD increments are shown in the insert.

Allowable Increments for PSD

Prevention of Significant Deterioration (PSD) increments establish the maximum allowable increases in pollutant concentrations in areas where the National Ambient Air Quality Standards have been achieved.

		Allowable Increment ($\mu g/m^3$)	
Pollutant	**Averaging Time**	**Class I Area[1]**	**Class II Area[2]**
SO_2	3 hr (max)	25	512
	24 hr (max)	5	91
	Annual[3]	2	20
NO_2	Annual[3]	2.5	25
PM_{10}	24 hr (max)	8	30
	Annual[3]	4	17

[1] Designated areas (e.g., international parks, national parks over 6,000 acres, national wilderness areas over 5,000 acres)
[2] Remainder of the United States
[3] Arithmetic mean

The EPA has also established New Source Performance Standards (NSPS) that set forth emission standards, monitoring requirements and reporting requirements for a number of individual industrial or emission source categories. The applicability of NSPS requirements are based on date of construction and size of the new emission source. The Big Stone Power Plant is not regulated under NSPS requirements.

Under Title III (Hazardous Air Pollutants) of the Clean Air Act Amendments (CAAA) of 1990, EPA was required to identify source categories or subcategories that emit any quantity of 189 chemicals initially listed for air toxics emission regulation. Subsequent to identification of these sources, EPA was required to issue National Emission Standards for Hazardous Air Pollutants (NESHAPs) based on use of "maximum achievable control technology" for new sources (and possibly less stringent standards for existing sources). Emissions from specific source categories are contained in the NESHAPs (40 CFR, Parts 61 and 63).

The State of South Dakota has incorporated standards and procedures required by EPA into its environmental regulations. PSD, NSPS, and NESHAPs regulations have been incorporated into State law, and the State of South Dakota has adopted the NAAQS for all pollutants.

4.4.1 Affected Environment

Regulatory oversight of the Big Stone Power Plant falls within the jurisdiction of the South Dakota Department of Environment and Natural Resources (DENR), which is headquartered in Pierre, SD. The offices in Pierre provide the point of contact for dealing with air quality regulations.

For air quality designation purposes, Grant County is included among areas of the State of South Dakota that have been determined to be either unclassifiable or in attainment with the NAAQS for all criteria pollutants. Grant County borders two counties in Minnesota, Lac Qui Parle and Big Stone, which have similar air quality. The nearest Class I areas are over 300 kilometers from the Big Stone Power Plant, as shown on **Figure 3-1**.

The Big Stone Plant is approximately 5 miles from the Big Stone Refuge, Big Stone County, Minnesota, which should not be affected by operation of the AHPC system. The AHPC project would be expected to reduce emissions and deposition in the vicinity of the plant.

The AHPC demonstration project at the Big Stone Plant would control particulate matter air emissions from a 450-MW cyclone-fired boiler (Unit #1). Currently, flue gas from Unit #1 passes through the ESP (consisting of four chambers each having four fields) to remove particulate, and a flue gas conditioning agent may be used to help control particulate and opacity emissions.

From 1975 to 1995, the primary fuel for Unit #1 was North Dakota lignite, but in 1995 the primary fuel was switched to Powder River Basin (Wyoming) subbituminous coal, which contains approximately one-half of the moisture and one-third more heating value than North Dakota lignite. The fuel switch created a decrease in the particulate collection efficiency of the ESP due to increased resistivity of the fly ash. The combination of a very fine particle size produced from the cyclone-fired boiler and high ash resistivity resulted in problems both in terms of meeting opacity requirements and in maintaining the ESP. Unlike the ESP, the AHPC can provide very high collection efficiency for different types of coals, since emissions are not significantly affected by ash resistivity.

Although coal remains the primary fuel at the Big Stone Power Plant, in 1990, Otter Tail Power Company began evaluating alternative fuels such as refuse- and tire-derived fuels. These fuels tend to burn cleaner and are more economical than coal. Since 1991, these materials have provided 2% to 10% of the total fuel burned at the Big Stone Power Plant.

The Big Stone Plant operates under air quality requirements established by the State of South Dakota, including requirements specified in a Title V Air Quality Operating Permit and an Acid Rain Permit. Pertinent conditions and requirements relating to air emissions (although only particulate and opacity emissions would be affected by the AHPC project) for Unit #1 are indicated in **Table 4-1**.

Table 4-1. Selected Permit Requirements Enforced by the State of South Dakota

EMISSION SOURCE	REQUIREMENT
Unit #1 Cyclone Boiler	Operation of continuous opacity monitoring system to record the opacity. A yearly audit must be conducted on the monitoring system.
	Operation of continuous emission monitoring system for nitrogen oxides, sulfur dioxide, opacity, and flue gas flow.
	Maximum particulate matter emissions of 0.26 lb per million Btu.
	Maximum sulfur dioxide emissions of 3 lb per million Btu.
	Maximum nitrogen oxides emissions of 0.86 lb per million Btu.
	Opacity limit of 20%.

4.4.2 Environmental Consequences

Construction Impacts

Construction of the proposed AHPC system would produce short-term, low-level, intermittent, and transient emissions of NO_x, PM_{10}, and CO from the coming and going of trucks and operation of construction machinery. Due to the small and temporary increase in traffic that would be needed for facility construction, no appreciable affects on ambient air pollutant concentrations from vehicle emissions would be expected. Construction activities would be substantially confined to the inside of the existing the ESP building and would not be expected to create substantial dust.

Operation Impacts

A Title V Air Quality Operating Permit from the State of South Dakota DENR defines air emission limits during facility operation. This permit would establish controls and emission limits for the AHPC. Discussions with South Dakota's permitting authorities have been initiated; regulatory personnel consider installation of the AHPC to be an action that would not constitute a modification under Title I of the Clean Air Act. Therefore, the AHPC project would require a minor permit application. Otter Tail Power will continue to coordinate with regulatory officials on permitting and compliance matters.

The major environmental consequence of the proposed AHPC system would be a reduction in particulate matter air emissions when compared to emissions from the current operations using an ESP. Much of the additional particulate matter collected by the AHPC, as compared to the ESP, would be in the form of fine particulate. Research indicates that AHPC technology provides at least an order of magnitude better particulate removal efficiency than an ESP, which becomes even more magnified for very fine particulate collection. AHPC technology has shown an ability to achieve 99.99% particulate collection efficiency for all particle sizes from 0.01 to 50 μm in pilot-scale tests.

Table 4-2 compares the particulate emission levels on a grains-per-actual-cubic-ft (gr/acf) and a ton-per-year basis for the ESP and the AHPC system. Since the proposed AHPC system would be the first, full-scale unit in this application, the level of emissions that would ultimately be achieved cannot be precisely predicted.

Table 4-2. Comparison of Unit #1 Emissions

CRITERIA POLLUTANT	ESP*		AHPC**	
	Gr/acf	tons/year	gr/acf	tons/year
Particulate Matter	0.0045	278	0.0001	6

*Emissions based on most recent stack test
**Projected emissions based on tests from an on-site pilot unit

As shown in **Table 4-2**, the AHPC is projected to reduce the current particulate concentration in flue gas (gr/acf) by an order of magnitude and to reduce total annual particulate emissions by over 95%.

Since the AHPC project would only control the emissions from Unit #1, the project would not affect emissions from other facility sources (non-combustion sources). The long-term benefit of cumulative particulate reductions would be dependent on the life of the AHPC. Any short-term or long-term effect that the AHPC system has on Class I areas would be positive since the AHPC system would decrease particulate emissions.

4.5 SURFACE/GROUND WATER RESOURCES/SPILL CONTROL PLANS

4.5.1 Affected Environment

Surface water is used at the Big Stone Power Plant for plant operations and condenser cooling. The water source is Big Stone Lake. The Power Plant uses a 340-acre man-made pond for cooling purposes, with makeup water being supplied throughout the year under certain conditions. Water is pumped from the lake at intervals, as specified in the water appropriations permit, when lake levels allow. The appropriations permit allows up to 7,000 acre-feet of water to be taken annually from Big Stone Lake. The Grant/Roberts Rural Water System supplies the domestic water to the plant.

A ground water monitoring program has been in place at the plant since 1971. Since the Power Plant began operation on May 1, 1975, the ground water monitoring program has been changed as conditions warranted. The current solid waste permit requires groundwater monitoring near disposal areas. In addition, the plant monitors additional sites for informational purposes. A total of 19 wells and four surface water sites are sampled three times per year. Water monitoring reports are submitted annually to the South Dakota Department of Environment and Natural Resources.

An SPCC spill control plan is in place for the plant and is updated at least every three years as required by regulation.

4.5.2 Environmental Consequences

Construction Impacts

The AHPC would be installed within the footprint of the existing ESP. No surface water or ground water issues would result from construction of the AHPC system. Spills, if any, would be handled by the existing spill plan.

Operation Impacts

The existing operations use water for several flyash-related applications. A humidification system is used for resistivity control and precipitator performance. The approximate flow rate is 10 gpm when the system is operating. Resistivity issues would not be concern following AHPC operation, and the humidification system would not be used.

Currently, flyash handling involves pneumatic transport from the ESP to a flyash silo. The flyash is then transported by a scraper-hauler to a landfill located on the plant site. The existing procedure uses some plant water for ash wetting and dust control, and this procedure would not be changed subsequent to AHPC operation. Since the increase in collected flyash would be only 0.99%, the increase, if any, in water used for dust control would be negligible.

4.6 WASTEWATER

4.6.1 Affected Environment

Wastewater currently generated by operations at the Big Stone Plant is all handled on site. The plant is a zero discharge facility, which precludes the need for a NPDES permit. The cooling pond handles most of the wastewater on the site, and holding and evaporation ponds are used to contain excess wastewater. A brine concentrator is used to process a portion of the wastewater, and treated water is returned to plant for reuse. A NPDES Stormwater permit has been obtained for the site. Wastewater quantities would not change as a result of AHPC installation and operation.

4.6.2 Environmental Consequences

Construction Impacts

No wastewater would be generated from construction of the AHPC.

Operation Impacts

No additional wastewater would be generated as a result of AHPC operation.

4.7 SOLID AND HAZARDOUS WASTE MANAGEMENT

4.7.1 Affected Environment

The Big Stone Plant currently holds a solid waste permit, which includes approval for an ash fill site on the Plant's property, from the South Dakota Department of Environment and Natural Resources. The ash fill site is permitted for a maximum of 250,000 tons per year of ash generated from fuel combustion. The solid waste permit also approves disposal of wood products, rubble, construction and demolition debris, and similar non-malodorous wastes from the Big Stone Plant in a Restricted Use Landfill, which is permitted to accept 100 tons per year.

4.7.2 Environmental Consequences

Construction Impacts

Construction waste, which would result from removal of existing equipment, would be examined for potential reuse, salvage, removal by the construction contractor, or placement in the Restricted Use

Landfill. Waste materials determined to be inappropriate for such applications would be transported for disposal in a permitted off-site landfill.

Operation Impacts

The types of wastes produced at the Big Stone Plant would not substantially change from current conditions as a consequence of operations of the proposed AHPC.

Subbituminous coal and other alternative fuels burned each year at the Big Stone Plant result in the production of fly ash and bottom ash. The on-site landfill is permitted to accept up to 250,000 tons per year of these by-products. The total amount of ash material landfilled is dependent on quantities of fly ash and bottom ash that are sold for beneficial uses and removed from the site. From 1997 through 2000, the amount of landfilled fly ash and bottom ash has ranged from 85,000 tons to 169,000 tons, which is well below the permitted maximum of 250,000 tons per year.

The existing electrostatic precipitator emits flyash at a stack gas loading of approximately 0.0045 grains/acf. The AHPC would remove 99.99% of the particulates from the stack gas and reduce ash loading to approximately 0.0001 grains/acf. The AHPC would generate less than 300 tons of additional fly ash per year, which would not pose any problems for disposal in the existing landfill.

4.8 LAND USE

4.8.1 Affected Environment

The Advanced Hybrid Particulate Collector would be installed in the same location as the current electrostatic precipitator. No change in land use would result from installation of the Advanced Hybrid Particulate Collector.

4.8.2 Environmental Consequences

Construction Impacts

The AHPC would use the same footprint as the existing ESP.

Operation Impacts

Operation of the AHPC would result in the generation of less than 300 tons per year of additional solid waste, which would be disposed of at Big Stone Plant's permitted landfill. This quantity of additional waste would not substantially influence land use at the landfill.

4.9 FLOODPLAINS & WETLANDS

4.9.1 Affected Environment

The AHPC would be located within a developed area of the Big Stone Plant. No wetland areas exist in the vicinity of the proposed project.

4.9.2 Environmental Consequences

Due to the lack of wetlands in the AHPC project area, no effect on wetlands would result from the AHPC project.

4.10 BIODIVERSITY AND ENVIRONMENTALLY SENSITIVE RESOURCES

Biodiversity in an ecosystem or community is characterized by the richness of the natural flora and fauna in terms of the number of habitat types or diversity of species.

4.10.1 Affected Environment

The biodiversity of the land in the vicinity of the proposed project can be characterized as relatively low because of the historic nature of land use and human activities in the area. Installation and operation of the AHPC would occur in a developed area of the facility. Environmentally sensitive resources do not exist in these areas.

4.10.2 Environmental Consequences

Since the impacts from the proposed project would be confined to currently developed areas with no environmentally sensitive resources and low biological diversity, no adverse impact would be expected.

4.11 ECOLOGICAL RESOURCES

4.11.1 Affected Environment

The land surrounding the proposed site for the AHPC consists of developed property used to support industrial operations at the Big Stone Plant. Terrestrial and aquatic ecosystems are not threatened, and endangered species are not present.

4.11.2 Environmental Consequences

Since the impacts from the proposed project would be confined to currently developed areas, no adverse impacts to fish, plant, or wildlife species would be anticipated from construction or operation of the proposed project. Contact with the U.S. Fish and Wildlife Service (USFWS) confirmed that the proposed project would not be likely to involve any Federally listed threatened or endangered species or their habitats, and thus would have no impact on protected fish and wildlife resources (Section 11.1).

While the threatened bald eagle may nest in areas throughout South Dakota, the construction activities would occur within an area of industrial activity where nesting would not be anticipated.

The USFWS did express a concern regarding potential contamination of surface water or ground water due to leaching of metals from landfilled ash. Section 4.5 describes the water monitoring and reporting program implemented at the Big Stone Power Plant to protect water resources from contamination.

4.12 HISTORIC AND CULTURAL RESOURCES

4.12.1 Affected Environment

A review of the South Dakota and Federal Registers of Historic Places did not result in identification of any listed historic or cultural properties in Grant County.

4.12.2 Environmental Consequences

No archaeological, cultural, or traditional use sites would be impacted by the proposed project.

4.13 SOCIOECONOMIC RESOURCES

4.13.1 Affected Environment

Within the nearby cities of Big Stone (SD) and Ortonville (MN), the combined population is about 2,800. The total population of cities within a 10-mile radius is approximately 6,500, with the largest city being Milbank, SD.

The Big Stone Plant employs over 70 Otter Tail Power Company employees to achieve 24 hour-per-day operation of the Power Plant.

4.13.2 Environmental Consequences

Construction Impacts

The contractors anticipated for project construction would not be headquartered in the local area, although area workers may be hired to participate in the construction. Approximately 150 workers would be required for the project. The local communities would be expected to be capable of accommodating the needs of the workforce for a construction project of this relatively short duration.

Operation Impacts

No additions to the existing workforce at the Power Plant would be required for operation of the AHPC. All labor requirements for the new system would be provided from the existing workforce.

No impact on traffic patterns, housing, or other infrastructure would be expected in the Big Stone community or in surrounding communities.

4.14 SAFETY AND HEALTH

4.14.1 Affected Environment

The affected environment pertaining to the safety and health of workers and the public would be limited to areas involving construction and operation of the AHPC.

The Big Stone Plant maintains a trained rescue squad in case of emergencies. Any emergencies that arise during hours when the plant workers are not on site are typically handled by the local fire department in Big Stone City.

4.14.2 Environmental Consequences

All Occupational Safety and Health Administration regulations would be followed for AHPC system installation and operation. An existing safety program at the Big Stone Plant, including a policy manual, monthly safety meetings, a safety committee, lockout/tagout procedures, and a confined space entry program, would be applicable to operations required for the AHPC system.

Construction Impacts

Potential health impacts to workers during construction would be limited to normal hazards associated with routine construction or repair of power plant equipment during a scheduled outage.

All contractors on site would be provided with a mandatory safety review meeting, and the contractor would be required to sign work guidelines. As a standard practice for construction activities, worker guidelines that summarize the more important safety concerns of the Big Stone Power Plant are issued at the start of each project, and each guideline must be signed and returned by every contract worker on the Power Plant site.

Operation Impacts

During operation of the AHPC, health and safety risks would result from potential exposures to hot flue gases, compressed air, high and low voltage electrical systems, and falls.

Most of the identified exposure risks are present with the existing ESP, and Plant employees are trained in the safe operation and maintenance of this type of equipment. Additional training would be completed to instruct employees on all aspects of operating and maintaining an AHPC. This training would specifically review new equipment, such as clean air plenums, compressed air headers, and new rapper, electrode, and plate styles. Similar equipment currently exists at the Big Stone Power Plant.

4.15 TRAFFIC AND TRANSPORTATION

4.15.1 Affected Environment

The Big Stone Plant is located in a rural area and experiences few traffic concerns. The principal traffic arteries around the Big Stone Plant are South Dakota Highway 109 and U.S. Highway 12.

4.15.2 Environmental Consequences

Construction Impacts

Approximately 150 workers would be required for construction of the AHPC project, which is typical of the workforce involved during a normal plant shutdown. Due to the availability of hotel rooms, most of the AHPC construction workers would travel by U.S. Highway 12 or S.D. Highway 109 and would only slightly increase the traffic on these roads. The level of increase would be consistent with changes typical of past plant outages.

Operation Impacts

The operating requirements of the AHPC would be provided by the existing Big Stone Plant staff. No increase in traffic would result.

4.16 NOISE

4.16.1 Affected Environment

The Big Stone Plant is located in a rural area between 1 and 2 miles Northwest of Big Stone City/Ortonville, which has a combined population of about 2,800.

4.16.2 Environmental Consequences

Construction Impacts

During construction of the AHPC project, noise levels would increase at the plant due to routine construction activities. Since this project would be completed during a plant outage, the net effect on the environment would likely decrease.

Operation Impacts

The only change in noise level following installation of the AHPC system would be the occasional operation of solenoid valves for cleaning the bag components.

4.17 POLLUTION PREVENTION

Construction of the AHPC system would result in removal of an estimated 500 tons of steel from the existing ESP structure. Priorities for disposition of this material would be reuse or salvage. Removed steel that could not be reused or salvaged would undergo disposal using an off-site permitted landfill or the on-site Restricted Use Landfill.

Approximately 300 tons per year of flyash would be collected by the proposed AHPC system. Consistent with on-going efforts by Otter Tail Power Company to market flyash collected from the existing ESP, markets for the additional material would be sought. Flyash that cannot be marketed would undergo disposal using the approved on-site ash landfill.

The existing character of the Big Stone Power Plant as a zero-discharge facility for wastewater would not be affected by installation and operation of the AHPC system.

4.18 ENVIRONMENTAL JUSTICE

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that Federal Agencies identify and address any disproportionately high and adverse human health or environmental effects on minority or low-income populations that result from Federal actions. **Table 4-3** presents population demographics relevant to consideration of environmental justice concerns.

Table 4-3. Comparison of Demographics for Geographic Areas in 2000

CHARACTERISTIC	GEOGRAPHIC AREA		
	USA	SOUTH DAKOTA	GRANT COUNTY
Population under 5 years	6.8%	6.8%	5.9%
Population over 65 years	12.4%	14.3%	19.1%
White persons	75.1%	88.7%	98.6%
Black persons	12.3%	0.6%	-
Native American persons	0.9%	8.3%	0.4%
Asian persons	3.6%	0.6%	0.2%
Hispanic or Latino persons	12.5%	1.4%	0.5%
Population Change (1990-2000)	13.1%	8.5%	-6.3%
Median household income	$37,005	$31,354	$34,381
Persons below poverty	13.3%	14.0%	10.4%
Children below poverty	19.9%	19.0%	13.4%

As shown in the Table, the demographics of Grant County indicate a population loss since 1990 and an area of relatively low minority population. Poverty levels of individuals and children in Grant County are substantially lower than levels for the U.S. and South Dakota. Based on these demographics, the proposed action is considered to represent an activity that would not result in any disproportionate adverse impact to low-income or minority populations.

4.19 UNAVOIDABLE ADVERSE EFFECTS

For installation and operation of the AHPC system, the following unavoidable adverse impacts would be anticipated:

- Increase in noise levels during construction (short duration)
- Potential short-duration increase in airborne dust and particulate during operation of construction equipment