

4.0 CUMULATIVE IMPACTS

4.1 DEFINITION OF CUMULATIVE IMPACTS

Council on Environmental Quality (CEQ) regulations define cumulative impacts as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other action.”⁸¹

4.2 REGION OF INFLUENCE

The region of influence varies with each resource, and is discussed by resource later in this Section.

4.3 PROJECTS AND ACTIVITIES CONSIDERED

4.3.1 Other Planned Energy Projects

Kansas City Power & Light (KCP&L) applied for and received on January 31, 2006, an air quality permit to construct a project known as Iatan II. This project includes a new 930 megawatt (MW) gross coal fired electric generating unit to be located adjacent to the existing KCP&L Iatan I electric generating unit. The air quality permit for this project also includes upgrades to the air pollution control system for the Iatan I existing unit.

There are no other known firm plans for energy projects within the impact area of the proposed project.

4.3.2 Potential Future Expansion at Norborne Plant

The plant would be constructed with allowance for up to two more 660 MW net units (AECI, 2005f); however, there are no present plans for expansion at Norborne beyond the one unit that is the subject of this environmental impact statement (EIS).

⁸¹ (40 CFR 1508.7)

4.3.3 Other Projects

There is one operating ethanol plant in the vicinity of the Proposed Action and one proposed. The operating plant is at Malta Bend in Saline County about 20 miles east-southeast of the Proposed Action plant site. It has a current capacity of about 50 million gallons per year and the owner, Mid-Missouri Energy, plans to add capacity to the plant to achieve about 96 million gallons per year capacity. The plant uses about 375,000 gallons of water per day, which is withdrawn from two wells drilled into an aquifer adjacent to the Missouri River north of the plant. (Springfield News-Leader, 2006).

The proposed plant will be in Carroll County, east of Carrollton, with construction expected to start in 2007, and operations in 2008. This plant will be owned by Show Me Ethanol, and has a planned capacity of 50 million gallons per year (MoCorn, 2006). There are also plans to build a biodiesel plant near Carrollton (American Energy Producers Inc., 2006).

Carroll County does not have specific plans for development. As discussed in *Section 3.7.1.2.1, Land Use Profile*, preservation of agriculture is an important aspect of their plan. All the land in the vicinity of the plant is zoned agricultural. Power plants do not typically create an impetus for other development except for the minor development associated with plant employees who would be relocating to the area.

4.4 CUMULATIVE IMPACTS AND MITIGATION BY RESOURCE

4.4.1 Air Resources

4.4.1.1 Regulated Emissions

NAAQS. The air quality permit application for the Proposed Action describes the results of air quality modeling. These results show the impact of the Proposed Action by itself (as described in *Section 3.1.2.4.1, Impact Assessment*), and for the cumulative impact, the results of the Proposed Action, along with other existing and proposed air pollution sources within 50 km of the affected environment. These cumulative modeling results form the basis for describing the cumulative impacts of the Proposed Action.

Receipt of an air quality permit from the Missouri Department of Natural Resources (MDNR) is based on AECL's demonstration that the cumulative

impact of the Proposed Action together with all other existing and proposed sources must:

- not result in a violation of a National Ambient Air Quality Standard (NAAQS), or
- if there is an existing measured and modeled violation of a NAAQS, the Proposed Action must not significantly contribute to that violation.

AECI's modeling of cumulative air quality impacts, conducted for its air quality permit application, shows that the highest concentrations of pollutants for which there are NAAQS⁸² do not exceed the relevant NAAQS (Table 4-1).

Table 4-1. Highest Model-Predicted Pollutant Concentration - All Norborne Sources and Other Existing and Planned Major Sources within Norborne's Area of Impact

<u>Pollutant/Averaging Time</u>		<u>Highest Modeled Concentration</u>	<u>NAAQS</u>
		<u>($\mu\text{gm}/\text{m}^3$)</u>	<u>($\mu\text{gm}/\text{m}^3$)</u>
<u>SO₂</u>	<u>3-hour</u>	<u>1,007</u>	<u>1,300</u>
	<u>24-hour</u>	<u>229</u>	<u>365</u>
	<u>annual</u>	<u>21</u>	<u>80</u>
<u>NO₂</u>	<u>annual</u>	<u>40</u>	<u>100</u>
<u>PM₁₀</u>	<u>24-hour</u>	<u>125</u>	<u>150</u>
	<u>annual</u>	<u>20</u>	<u>50</u>

Based on this analysis, the Proposed Action would not have a significant cumulative impact.

Mercury. Because mercury deposition is a worldwide phenomenon, mercury emissions would contribute to the cumulative impact of mercury emissions worldwide; however the impacts would occur primarily in the vicinity of the plant. Mercury emissions would be limited to standards set by EPA (40 CFR Part 60 subpart HHHH).⁸³

⁸² There are also NAAQS for carbon monoxide and lead; however, the proposed project by itself does not have a significant impact (as defined by the EPA) of ambient levels of these pollutants. Therefore, these pollutants are not included in the modeling for cumulative impacts.

⁸³ Missouri rule 10 CMR 10.6.368(3) establishes mercury emission budgets (allowable annual emissions) for power plants. Since the proposed project would be a new facility under MDNR

Addition of more units at the facility would result in additional emissions and the need to acquire another air permit.

4.4.1.2 Unregulated Emissions—Greenhouse Gases

Consideration of the cumulative impact of the Proposed Action on global climate change caused by greenhouses gasses (GHGs) presents a unique challenge. There are no standards available to assess significance. Since GHGs are not currently regulated at the state or national level, they are not taken into account in MDNR's assessment of cumulative impacts and there are no state or federal regulatory or statutory standards to assess the significance of the Proposed Action's impact on global climate change. The Council on Environmental Quality (CEQ) regulations that implement NEPA state, "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."⁸⁴ The Proposed Action would contribute to the cumulative impact of climate change, as do all activities that result in the emission of GHGs, no matter how minor. To interpret "individually minor" to mean *any* activity that results in GHG emissions and thus contributes to a significant cumulative impact would make the concept meaningless: most federal actions would then have significant impacts. The question of significance here is whether or not there is sufficient basis to conclude that the Proposed Action meets the threshold of being a large enough contributor of GHGs to be considered significant in terms of potential contribution to global climate change. This assessment needs to consider that the latest consolidated scientific information (IPCC, 2007a, b, c), indicates that climate change is already occurring and that reversing or even slowing the current trends will require massive (global-scale) changes in energy generation and technology. The question of significance is discussed below in terms of the contextual nature of CEQ's concept of significance, and of CEQ's recommendation for established baseline criteria by which the significance of cumulative impacts may be judged.

rules, the proposed unit would receive no budget allocation. Mercury emissions from the proposed project would have to be accounted for within AECI's mercury budget allocation for its other, existing Missouri units (New Madrid, Thomas Hill, and Chamois), or AECI would have to purchase emissions allocations from other units which have excess allocations that can be sold by their owner.

⁸⁴40 CFR Sec. 1508.7

Context of Significance. Significance, according to the CEQ regulations, is contextual, and a site-specific action would not be expected to be considered in a global context: "...in the case of a site-specific action, significance would usually depend on the effects in a locale rather than the world as a whole."⁸⁵ In a global context, the contribution of a single site-specific action is almost by definition exceedingly small, or at least not practicable to quantify. Consider, for example, that "China is currently constructing the equivalent of two, 500 megawatt, coal-fired power plants per week and a capacity comparable to the entire UK power grid each year" (MIT, 2007). Consistent with the CEQ regulations, a nationwide or possibly a large-scale regional policy or action that would affect GHG emissions might meet the threshold criteria for evaluating global significance, but a single site-specific action would not.

Baseline Condition. To assess significance in the context of cumulative impacts, CEQ guidance states that "the analyst must use a conceptual model of the important resources, actions, and their cause-and-effect relationships" (CEQ, 1997). "The critical element in this conceptual model is defining an appropriate baseline or threshold condition of the resource, ecosystem, and human community beyond which adverse or beneficial change would cause significant degradation or enhancement of the resource, respectively" (CEQ, 1997). The assessment of significance is then made by comparison to this baseline condition. In the context of climate change, this baseline condition has not been defined, and is subject to on-going debate. Without a defined baseline, or standard, there is no defensible way to assess whether the impacts of the Proposed Action are significant.

USDA/RD concludes that in consideration of the CEQ regulations and guidance as summarized above, there is not sufficient basis to support a determination of the significance of the Proposed Action related to global climate change. This is based on information currently available regarding the impacts of the Proposed Action in a global context, and the uncertainty of an appropriate baseline condition, or standard, against which to judge significance.

⁸⁵ 40 CFR Sec. 1508.27

4.4.2 Geology and Soils

The region of influence for geology and soils are those areas in the immediate vicinity of the Proposed Action.

These resources would not be impacted by other known planned projects, nor by expansion of the plant at Norborne with the addition of more capacity.

4.4.3 Groundwater

The region of influence for groundwater impacts is limited to the area within a mile or two of the well field.

Groundwater would not be impacted by other known planned projects. While both the Iatan project and the Malta Bend project use the Missouri River or its aquifer as a water source, neither are within the region of influence for this project. It would be impacted by expansion of the plant at Norborne because of the additional water requirements. The Missouri River aquifer has the capacity for additional water needs, but impacts of additional water withdrawals on other users would need to be assessed when and if the expansion occurs.

4.4.4 Surface Water

The region of influence for surface water impacts are the streams downstream of and in the vicinity of the Proposed Action, including the Missouri River.

Surface water in the vicinity of the plant would not be impacted by other known planned projects. If the plant were expanded, discharge water volumes would increase commensurate with additional water needs, resulting in potential impacts to the Missouri River because of increased discharges. Expansion would also mean increased use of coal, fuel oil, water treatment chemicals, and other chemicals with potential to impact surface water. The need to expand treatment facilities would be assessed if the plant were expanded.

4.4.5 Floodplains

As discussed in *Section 3.5.1.3, Region of Influence*, the region of influence for floodplain impacts is expected to be limited to the immediate vicinity of the plant site.

Floodplain impacts in the vicinity of the plant would not be affected by other known planned projects. There would probably be some small floodplain impacts if the plant were expanded, due to the need to construct larger coal storage facilities and possibly other plant facilities such as those for cooling water, fuel oil, wastewater facilities and water treatment chemicals.

4.4.6 Farmland

Farmland impacts are continually occurring throughout the United States (U.S.), with suburban development, road construction and other development. Other planned energy projects would also have farmland impacts, but not in the project area. Expansion at the plant would not be expected to result in additional farmland impacts except for minor impacts that may occur if new worker housing is constructed in the floodplain. Carroll County recognizes the value of its farmland and plans to preserve it to the extent practicable with development. Carroll County does not currently plan to rezone the agricultural area surrounding the proposed plant site.

This Proposed Action combined with all other development in farmland throughout the country result in a continual nationwide loss of farmland. The overall contribution of this project is negligible.

Expansion at the Norborne Plant would not impact farmland, except that additional buffer area around the plant would need to be acquired. This buffer land could continue to be used for its present uses.

4.4.7 Land Use

The region of influence for land use impacts is the area in the immediate vicinity of the Proposed Action.

Other planned projects would not impact land use in the project area. Expansion at the Norborne Plant would not impact land use, except that additional buffer area around the plant would be needed.

4.4.8 Public Lands, Recreation and Visual Resources

The region of influence for impacts on recreation, public land and visual resources is the area within a few miles of the Proposed Action.

Other planned projects would not impact recreation and visual resources in the project area. Expansion at the Norborne Plant would not impact recreation or public lands but would have a marginal increase in visual impacts due to the need to add more facilities.

4.4.9 Vegetation

The region of influence for vegetative impacts is the area in the immediate vicinity of the Proposed Action.

Other planned projects would not impact vegetation in the project area. Expansion at the Norborne Plant would not impact vegetative resources.

4.4.10 Wetlands, Riparian Areas, and Waters of the United States

Impacts on wetlands and Waters of the United States are continually occurring, with suburban development, road construction and other development projects. Other planned energy projects would also have impacts on wetland and Waters of the United States, but not in the project area. Expansion at the plant would occur within the existing facility boundaries and would not have impacts on wetland and Waters of the United States at the facility. There would potentially be some minor impacts with construction of additional transmission lines and if the well field would need to be expanded or a new field developed.

4.4.11 Fisheries and Wildlife

Impacts on fisheries and wildlife occur with on-going development projects throughout the United States. Other planned energy projects may have impacts on fisheries and wildlife, but not within the project area. Expansion at the plant has the potential for increased impact on fisheries because of the increase in discharge water to the Missouri River and potential minor impacts due to the increase in employment. It also would have the potential for

increased impact on birds due to the need to construct more transmission lines.

4.4.12 Threatened, Endangered, Proposed, and Other Special Status Species

Other planned projects would not impact special status species at the plant site. Expansion at the plant would not be expected to impact special status species. Impacts to special status species occur with development projects throughout the United States. The overall contribution of this project is negligible.

4.4.13 Cultural Resources

The region of influence for cultural resources is the immediate vicinity of the Proposed Action.

Other planned projects would not impact cultural resources at the plant site. Expansion at the plant would not be expected to impact cultural resources.

4.4.14 Socioeconomics and Environmental Justice

The region of influence for socioeconomic impacts is the three-county area in the vicinity of the proposed plant. No Environmental Justice impacts were identified for the Proposed Action.

Other planned projects would not be expected to have socioeconomic or environmental justice impacts at the project area. Expansion at the plant would have some socioeconomic impacts, but no environmental justice impacts. Expansion would mean more construction and operating jobs and increased traffic.

4.4.15 Public Safety and Services

The region of influence for public safety and services is the Norborne area and the highways near and leading to the plant site.

Other planned projects would not be expected to have impacts on public safety and services within the project area. Expansion at the plant would not be expected to result in additional impacts on public safety and services.

4.4.16 Noise

The region of influence for noise impacts is limited to a mile or two from the proposed plant and rail lines.

Other planned projects would not be expected to have impacts on noise within the project area. Expansion at the plant would result in additional noise impacts. Mitigation may be required.

4.4.17 Waste Management

The region of influence for impacts from waste management is the immediate vicinity of the utility waste landfill, the Norborne Plant, construction areas and the off-site waste management facilities that would be receiving general waste from construction and operation.

Other planned projects would not be expected to have impacts related to waste management for the Proposed Action, except that other planned projects may result in disposal at the same off-site landfills that would be used for the Proposed Action; these impacts would be minor. Expansion at the facility would result in the need to acquire additional property to create new landfill capacity because the proposed landfill would be sized for the proposed facility.