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."[69]

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).

[69] (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 The plant uses about 375,000 gallons of water per day, which is withdrawn from two wells drilled into an aquifer adjacent to the Missouri River north of the plant.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).

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

The air quality permit application for the Proposed Action describes air quality modeling results. These results include modeling results that 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 of the Proposed Action and other existing and proposed air pollution sources within and up to 50 km outside of the affected environment. These cumulative modeling results form the basis for describing the cumulative impacts of the Proposed Action.

At present, the cumulative modeling results are not available; however, in order to get an air quality permit, the Missouri Department of Natural Resources (MDNR) requires that AECI make a showing 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.

Since the Proposed Action cannot receive an air quality permit if one of these conditions is not met, and, since meeting these conditions means that the air quality impact of the Proposed Action is not significant, the Proposed Action cannot be built if there is a significant impact on air quality as represented by the NAAQS.

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.

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.

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 create new landfill capacity because the proposed landfill would be sized for the proposed facility.

4.5 SUMMARY OF CUMULATIVE IMPACTS

Planned new projects that would contribute to cumulative impacts are limited to the KCP&L Iatan II electric generating unit in Iatan, Missouri. This 930 MW coal fired unit has the potential to have cumulative air quality impacts when considered with the proposed Norborne plant. It is not anticipated that the Iatan II unit would have cumulative impacts other than for air quality.

If the Proposed Action receives an air quality permit from the MDNR, there would be no significant cumulative impacts. If the proposed unit does not receive an air quality permit, it cannot be built.

5.0 OTHER REQUIRED CONSIDERATIONS

5.1 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analysis include identification of "...any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented."[70]

This section describes irreversible and irretrievable commitments of resources associated with the implementation of the Proposed Action.

Irreversible resource commitments are related to the use of nonrenewable resources, such as soils, wetlands and visual resources, and the effects that the uses of these resources would have on future generations. Such actions are considered irreversible because their implementation would affect a resource that has deteriorated to the point that renewal can occur only over a long period of time or at great expense, or because they would cause the resource to be destroyed or removed.

Irretrievable resource commitment of natural resources means loss of production or use of resources as a result of a decision. It represents opportunities forgone for the period of time that a resource cannot be used. Irretrievable refers to the permanent loss of a resource including extinction of a threatened or endangered species, disturbance of a cultural site, loss of land production, or use of natural resources (including minerals and coal). For example, production or loss of agricultural lands can be irretrievable, while the action itself may not be irreversible.

5.1.1 Land Resources

The construction and operation of the proposed power plant and its associated facilities and infrastructure would require the commitment of approximately 2,000 acres of land for the plant footprint and additional land for roadway, landfill, substations, railroad connectors, and utility corridor zones; and the excavation and/or grading of an extensive amount of soil within this land. Approximately 750 acres would not be impacted and would be leased for continued agricultural use. This commitment would be irreversible for the life of the power plant. While it is possible that these

[70] 40 CFR 1502.16

structures, roads, railroad connectors, and utility corridor zones could be removed and the natural landscape renewed, this is unlikely in the foreseeable future.

5.1.2 Water Resources

The plant would require a maximum of about 7,400 gallons per minute (gpm) of water, which would be obtained from the Missouri River alluvial groundwater resources. This groundwater reserve is replenished by the river, and recovery of the reserve would occur quickly after pumping is stopped.

An estimated four or five acres of wetlands may be impacted (delineation has not yet been done for the rail alignments and transmission corridors). Given that the entire project is located in farmland with almost total replacement of natural vegetation and high modification of drainage conditions, wetlands that may be present at the site are of low natural quality and replaceable. The approximately three acres at the plant site are in a highly disturbed environment with low natural quality. It may be possible to avoid these wetlands; if not, they are replaceable. Loss of wooded wetlands, which may potentially occur in the rail corridor or transmission line, would not be easily replaceable as it would require some time for the trees to mature, but they could also be replaced.

The floodplain impacts are irreversible as long as the fill used to raise the plant elevation remains in place.

5.1.3 Biological Resources

Aside from farm impacts discussed above, the biological impacts at the plant site are mostly limited to the vegetated fence rows. Impacts to birds from the structures and transmission lines are irreversible as long as these structures are present.

5.1.4 Natural and Mineral Resources

During the lifetime of the proposed plant, it would burn approximately 100 million tons of coal. Fuel oil and limestone would also be consumed.

5.2 SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

NEPA requires consideration of the relationship between short-term uses of the environment and long-term productivity associated with a Proposed Action. This involves the consideration of whether a Proposed Action is sacrificing a resource value that might benefit the environment in the long term, or some short-term value to the sponsor or the public. In the context of the short-term uses of the environment associated with the operation of the facility and the long-term impairment of environmental resources as they have been analyzed in this environmental impact statement (EIS), short-term refers to the that period of time encompassing the life span of the power plant and its associated facilities to the period of time encompassing the disassembly of the plant and subsequent restoration and rehabilitation activities. Long-term refers to that period of time following restoration and rehabilitation activities, during which consequent impacts from the Proposed Action still affect the environment.

The proposed short-term uses of the environment associated with the Proposed Action are the development of about 2,000 acres of land for the footprint of the power plant and additional land for roadway, rail connectors, transmission lines, substations, well fields, landfill and discharge line; the consumptive use of an average of 5,600 gallons of water per minute of Missouri River aquifer water; the direct loss of farmland, vegetation, wildlife habitat, floodplains and wetlands; and the consumptive use of coal, limestone and other nonrenewable resources..

The projected period before natural conditions return to an approximate pre-project status within the project area is expected to exceed several decades following completion of restoration activities. Loss of topsoil in areas where buildings and pavement would be located is essentially permanent. Water withdrawals from the Missouri River aquifer would cease immediately and the aquifer would quickly recover.

Floodplains and wetlands restored following equipment removal and rehabilitation efforts would take several decades to recover pre-development characteristics. However, if restoration were to implement efforts to enhance riparian zones along the Missouri River, long-term productivity could eventually increase as compared to current conditions, which are characterized by poor natural quality of area floodplains and wetlands.

Immediately following the disassembly of the power plant and its associated facilities, and regrading and revegetation of the project site, the viewshed could be restored.

To the extent that operation of the power plant contributes incrementally to the long-term forcing of climate change and global warming due to its air emissions including greenhouse gases (GHGs), or contributes to the long-term increase in trace metal deposition, this project could contribute in a very small way to impacts on ecosystems. The relative emissions from this facility, compared to national and global emissions, are discussed in this EIS. The short-term social gains associated with the Proposed Action discussed in *Section 3.14, Socioeconomics and Environmental Justice*, would result in beneficial long term socioeconomic productivity in the vicinity of the project site.

6.0 CONSULTATION AND COORDINATION

This section describes the consultation and coordination the U.S. Department of Agriculture, Rural Development (USDA/RD) and AECI have had with government agencies and the public during preparation of this Draft Environmental Impact Statement (EIS). Information is presented concerning the scoping process, additional public involvement, additional agency consultation, as well as planned future agency and public involvement. A list of agencies, organizations, and individuals to whom copies of the Draft EIS were sent is also included.

6.1 SCOPING PROCESS

Scoping was the first step in the EIS process and is required by Council on Environmental Quality (CEQ) regulations[71]. Scoping is a process for determining the range of issues to be addressed in an EIS and for identifying significant issues associated with the alternatives. The objectives of the scoping process were to notify interested persons, agencies, and other groups about the Proposed Action and the alternatives being considered; solicit comments about environmental issues, alternatives to the Proposed Action, and other items of interest; and consider those comments in the preparation of the EIS.

The scoping process begins with a notice of intent (NOI) to hold public meetings and prepare an EIS published in the Federal Register. The NOI for this project was published on August 10, 2005. It briefly described the project, announced the dates, times and locations of four public scoping meetings, listed the locations where the Site Selection Study and Macro Corridor Study Report could be found, provided contact information for USDA/RD and AECI, and summarized the EIS process. The NOI also indicated the scoping comment period would extend to September 26, 2005. A copy of the NOI is included in *Appendix L, Federal Register Notices*. A second Federal Register notice dated September 30 extended the comment period to October 28, 2005.[72] It also provided the website address where project documents could be viewed, and an updated repository list. The October 28 notice is also included in *Appendix L, Federal Register Notices*.

[71] 40CFR1501.7
[72] Federal Register, September 30, 2005

The four public scoping meetings announced in the Federal Register were conducted in August 2005, one near each of the two primary alternative site locations identified for the new coal-fired power plant and two near the proposed transmission line corridors. In addition to the NOI, the public was notified by a series of advertisements in 26 local newspapers located in the surrounding areas of alternative sites and transmission line macrocorridors (AECI, 2005d).

6.1.1 Agency Scoping

An interagency scoping meeting was held on August 23, 2005. The list of agencies invited to the scoping meeting is included as Figure 6-1.

6.1.2 Summary of Comments by Category

The summary below by resource is taken directly from AECI's scoping document (AECI, 2005d).

Air. A total of 42 comments were received on air issues. Eighteen comments express concern regarding the emissions from the proposed power plant; six comments were related to impacts to health from the emissions. The remaining comments involved concerns about various pollutants (i.e. particulate matter (PM), nitrogen oxides (NO_X), sulfur dioxide (SO_2), and carbon dioxide (CO_2), emission trading, hazardous air pollutants (HAPs), climate change, and ash dust.

Aesthetics. A total of 15 comments were received concerning visual impacts from the transmission lines and facility buildings

Cultural Resources. A total of five comments were received on cultural resources. Comments included questions about historic buildings and bridges and potential archeological and historic sites.

Economics. There were 51 comments related to economics. Employment (12 comments) and land values (12 comments) were the major topics. This included giving local people priority on the jobs created, and the perceived decrease in property values around the power plant. Other comments included impacts to recreation and tourism in the Forbes site area; taxes and revenue benefits to the county; and the increase in population

AECI-AGENCY CONTACT LIST

Title	Firstname	Lastname	Position	Company1	Company2	Address1	Address2	Address3	City	State	Zip
Col.	Michael A.	Rossi	District Engineer	U.S. Army Corps of Engineers	Kansas City District	601 East 12th Street			Kansas City	MO	64106
Mr.	Jim	Gulliford	Administrator	U.S. Environmental Protection Agency	Region 7	901 North 5th Street			Kansas City	KS	66101
Mr.	Gerald M.	Jones	Assistant Manager	U.S. Department of Energy	Office of Kansas City Site Operations	2000 East 95th Street		PO Box 410202	Kansas City	MO	64131
Mr.	Charlie	Scott	Field Supervisor	U.S. Fish and Wildlife Service	Columbia Ecological Services Field Office	101 Park DeVille Drive, Suite A			Columbia	MO	65203
Mr.	George	Hendon	Division Manager	Federal Aviation Administration	Airports Division ACE-600	901 Locust			Kansas City	MO	64106
Mr.	Dick	Hainje	Regional Director	Federal Emergency Management Agency	Region VII – Kansas City	2323 Grand Boulevard, Suite 900			Kansas City	MO	64106
Mr.	Randy	Moore	Regional Forester	USDA Forest Service	Eastern Region – R9	626 East Wisconsin Avenue			Milwaukee	WI	53202
Ms.	Macie L.	Houston	Regional Director	U.S. Department of Housing and Urban Dev	Kansas City Regional Office	400 State Avenue, Room 200			Kansas City	KS	66101
Mr.	Fred	Ferrell	Director	Missouri Department of Agriculture		1616 Missouri Boulevard		PO Box 630	Jefferson City	MO	65102
Mr.	John	Hoskins	Director	Missouri Department of Conservation	Administrative Office	2901 West Truman Boulevard		PO Box 180, 65102	Jefferson City	MO	65109
Mr.	Gregory A.	Steinhoff	Director	Missouri Department of Economic Dev		301 West High Street		PO Box 1157	Jefferson City	MO	65102
Mr.	Ronald M.	Reynolds	Director	State Emergency Management Agency		2302 Militia Drive		PO Box 116, 65102	Jefferson City	MO	65101
Mr.	Doyle	Childers	Director	Missouri Department of Natural Resources		1101 Riverside Drive		PO Box 176, 65102	Jefferson City	MO	65101
Mr.	Mark	Miles	Director	Missouri Department of Natural Resources	State Historic Preservation Office	1101 Riverside Drive		PO Box 176, 65102	Jefferson City	MO	65101
Mr.	Pete	Rahn	Director	Missouri Department of Transportation	Central Office	105 West Capitol Avenue			Jefferson City	MO	65102
Ms.	Nancy	Thomson	Executive Director	Northwest Missouri Regional Council of Govts		114 West Third Street			Maryville	MO	65102
Mr.	Randy	Railsback	Executive Director	Green Hills Regional Planning Commission		1104 Main Street		PO Box 28	Trenton	MO	65102
Mr.	Larry	Atkins	Presiding Commissioner	Andrew County	County Courthouse	411 Court Street		PO Box 206	Savannah	MO	64485
Mr.	Rodney	Meyer	Presiding Commissioner	Benton County	County Courthouse	316 Van Buren		PO Box 1238	Warsaw	MO	65355
Mr.	Raymond	Hartley	Presiding Commissioner	Caldwell County	County Courthouse	49 East Main		PO Box 67	Kingston	MO	64650
Mr.	Nelson	Heil	Presiding Commissioner	Carroll County	County Courthouse	8 South Main, Suite 6			Carrollton	MO	64633
Mr.	Larry	Peters	Presiding Commissioner	Chariton County	County Courthouse	306 South Cherry			Keytesville	MO	65261
	Carol	McCaslin	Presiding Commissioner	Clay County	Planning and Zoning	234 West Shrader, Suite C			Liberty	MO	64068
Mr.	Mark	Hoover	Presiding Commissioner	Clinton County	County Courthouse	207 North Main		PO Box 245	Plattsburg	MO	64477
Mr.	David	Tolen	Presiding Commissioner	Daviess County	County Courthouse	102 North Main Street			Gallatin	MO	64640
Mr.	David (Dick)	Lippold	Presiding Commissioner	Dekalb County	County Courthouse	109 West Main		PO Box 248	Maysville	MO	64469
Mr.	Ronnie	Mercer	Presiding Commissioner	Gentry County	County Courthouse	200 West Clay Street			Albany	MO	64402
Mr.	Wayne	Voltmer	Presiding Commissioner	Holt County	County Courthouse	102 West Nodaway		PO Box 437	Oregon	MO	64473
Ms.	Katheryn	Shields	County Executive	Jackson County	County Courthouse	303 West Walnut			Independence	MO	64050
Mr.	William	Brenner	Presiding Commissioner	Johnson County	County Courthouse	300 North Holden Street			Warrensburg	MO	64093
Mr.	James	Strodtman	Presiding Commissioner	Lafayette County	County Courthouse	1001 Main Street			Lexington	MO	64067
Mr.	Lester	Keith	Presiding Commissioner	Nodaway County	County Courthouse	305 North Main, Room 105		PO Box 218	Maryville	MO	64468
Mr.	Rusty	Kahrs	Presiding Commissioner	Pettis County	County Courthouse	415 South Ohio			Sedalia	MO	65301
Mr.	Jim	Myles	Presiding Commissioner	Randolph County	County Courthouse	110 South Main Street			Huntsville	MO	65259
Mr.	Jeff	Adam	Presiding Commissioner	Ray County	County Courthouse	100 West Main Street			Richmond	MO	64085
Ms.	Becky	Plattner	Presiding Commissioner	Saline County	County Courthouse	101 East Arrow Street			Marshall	MO	65340
Mr.	Ronald	Bell	Refuge Manager	Squaw Creek National Wildlife Refuge		Highway 159 South		PO Box 158	Mound City	MO	64470
Mr.	John	Guthrie	Refuge Manager	Swan Lake National Wildlife Refuge		16194 Swan Lake Avenue			Summer	MO	64681
Mr.	Bill	Ely	Board of Supervisors	Richardson	County Courthouse	1700 Stone Street			Falls City	NE	68335
Mrs.	Leslie	Holloway		Missouri Farm Bureau		701 South Country Club Drive		PO Box 658	Jefferson City	MO	65102
	Interested Party			U.S. Geological Survey	Missouri District Office	USGS Building	1400 Independence Road		Rolla	MO	65401
	Interested Party			U.S. Department of the Interior	Bureau of Indian Affairs	Main Interior Building MS 2340	1849 C Street, NW		Washington	DC	20204
	Interested Party			Natural Resource Conservation Service	Missouri State Office	Parkade Center, Suite 250	601 Business Loop 70 W		Columbia	MO	65203
	Interested Party			Missouri Federal Assistance Clearinghouse	Office of Administration	Truman State Office Building, Rm 840	301 West High Street	PO Box 809	Jefferson City	MO	65102

Figure 6-1
Agency Scoping Contact List

during construction, as well as, the decrease once the plant is in commercial operation.

Farmlands. A total of 16 comments were received on farmland. The majority of the comments pertained to the conversion of farmland to industrial uses such as power plants.

Geology. There were five comments received expressing concern about the geology, particularly impacts to soils, erosion, and sinkholes.

Health & Safety. A total of 19 comments were received on health and safety. The majority of the comments pertained to effects of the pollutants from the plant on local and area residents, higher health risks for the public, and amplification of health problems for specific individuals.

Mercury. There were 34 comments received expressing concern about mercury. Sixteen of the comments pertained to emissions and 13 comments were related to health issues. The remaining comments were about waste disposal, fish contamination, and coal cleaning.

Purpose, Need and Alternatives. A total of 28 comments were received on purpose and need for the facility, 12 comments were received pertaining to use of alternative technologies, and eight comments were received concerning the siting analysis.

Recreation. There were 19 comments received expressing concern about potential impacts to recreation. The majority of the comments were from the Forbes site area regarding impacts to the Big Lake State Park and Squaw Creek National Wildlife Refuge (NWR).

Transmission. A total of eight comments were received on transmission. The majority of the comments pertained to electric and magnetic fields (EMFs).

Transportation. A total of 18 comments were received on transportation. The majority of the comments pertained to increased traffic in the area around the power plant, especially during flooding that is frequent to the area. Other comments expressed concern over railroad traffic, noise from the railcars, and impacts to local roads.

Waste. There were nine comments regarding waste, five concerned hazardous waste from the landfill.

Water Resources. A total of 70 comments on water issues were received. Almost half (37 comments) of the comments, express concern regarding water supply from groundwater withdrawal and how that withdrawal would impact local wells. Also of major concern is the potential impact from building in a floodplain and on wetlands. The remaining comments concerned contamination, wastewater, hydrology, pollution, storm water, barge traffic, and quality.

Wildlife. A total of 43 comments were received regarding impacts to wildlife. The majority were concerns for wildlife near the Forbes site, specifically wildlife in the parks and wildlife refuges in the area and bald eagles. Another concern was what impact the power plant and transmission lines would have on bird migration.

Other. There were 15 comments received expressing concern about noise pollution from operation of the plant and increased train and automobile traffic. Other comments concerned lighting, land use, odors, and cumulative effects.

6.1.3 Responses to Scoping

Comments received during scoping were summarized and tabulated in AECI's scoping report (AECI, 2005d). For most of the comments, AECI's scoping report indicated they would be addressed in the EIS process (AECI, 2005d). Several comments are not addressed in this EIS because they are unrelated to environmental impacts. Those included concerns about AECI and its dealings with county commissioners, suggestions to conduct a county-wide vote on allowing the power plant, and use of eminent domain to acquire property (AECI, 2005d).

Those comments that AECI's scoping document indicated would be addressed in the EIS process are specifically identified and listed under each affected resource in *Section 3, Affected Environment and Environmental Consequences*, in the subsections titled Identification of Issues. They are then addressed in the impact discussion for each resource. If applicable, actions to prevent or reduce impacts are identified. Specific items of interest can be looked up in the index, *Section 10*.

6.2 ADDITIONAL PUBLIC INVOLVEMENT

This Draft EIS will be available for a 45-day public review and comment period, during which time public hearings will be held.

The public and government agencies may submit comments on this Draft EIS during the comment period. Written comments should be addressed to the following:

Stephanie A. Strength USDA, Rural Development
Engineering & Environmental Staff
1400 Independence Avenue SW
Mail Stop 1570, Room 2244
Washington, DC 20250-1570
Telephone: 202-720-0468
Email: Stephanie.strength@wdc.usda.gov

The Final EIS will address comments received on the Draft EIS. The Final EIS will be available for a 30-day review and comment period after which the USDA/RD will prepare a Record of Decision (ROD). Notices announcing the availability of the Draft and Final EIS and the ROD will be published in the Federal Register and in local newspapers. Any final action by USDA/RD related to the proposed project will be subject to, and contingent upon, compliance will all relevant federal, state and local environmental laws and regulations and completion of the environmental review requirements as prescribed in the USDA/RD Environmental Polices and Procedures[73].

6.3 ADDITIONAL AGENCY CONSULTATION AND COORDINATION

The U.S. Army Corps of Engineers (USACE) is a cooperating agency for this EIS.

The Cultural Resources Assessment for the Norborne Site (AECI, 2006m) was submitted to the State Historic Preservation Officer (SHPO), who concurred on the recommendation that no sites are eligible for the NRHP. The concurrence letter is included in *Appendix I, State Historic Preservation Officer's Letter of Concurrence*.

[73] 7 CFR Part 1794

6.4 FUTURE PUBLIC AND AGENCY INVOLVEMENT

6.4.1 List of Agencies, Organizations, and Individuals to Whom Copies of the Draft EIS Are Sent

Following is the list of agencies to whom the Draft EIS will be distributed.

- Andrew County, Missouri
- Benton County, Missouri
- Caldwell County, Missouri
- Carroll County, Missouri
- Chariton County, Missouri
- Clay County, Missouri
- Clinton County, Missouri
- Daviess County, Missouri
- Dekalb County, Missouri
- Federal Aviation Administration
- Federal Emergency Management Agency
- Gentry County, Missouri
- Green Hills Regional Planning Commission
- Holt County, Missouri
- Jackson County, Missouri
- Johnson County, Missouri
- Lafayette County, Missouri
- Missouri Department of Agriculture
- Missouri Department of Conservation
- Missouri Department of Economic Development
- Missouri Department of Natural Resources
- Missouri Department of Transportation
- Missouri Farm Bureau
- Missouri Federal Assistance Clearinghouse

- Nodaway County, Missouri
- Northwest Missouri Regional Council of Governments
- Pettis County, Missouri
- Randolph County, Missouri
- Ray County, Missouri
- Richardson County, Nebraska
- Saline County, Missouri
- Squaw Creek National Wildlife Refuge
- State Emergency Management Agency
- Swan Lake National Wildlife Refuge
- U.S. Army Corps of Engineers
- U.S. Department of Energy
- U.S. Department of Housing and Urban Development
- U.S. Department of Interior
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Geological Survey
- USDA Forest Service
- USDA Natural Resource Conservation Service

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- East Hills Library, St. Joseph, Missouri
- Hale Library & Museum, Hale, Missouri
- Lexington Library, Lexington, Missouri
- Little Dixie Regional Library, Moberly, Missouri
- Macon Public Library, Macon, Missouri
- Marshall Public Library, Marshall, Missouri
- Maryville Public Library, Maryville, Missouri
- Mid-Continent Public Library, Excelsior Springs, Missouri
- Mid-Continent Public Library, Kearney, Missouri
- Mound City Public Library, Mound City, Missouri
- Norborne Public Library, Norborne, Missouri
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- Sweet Springs Public Library, Sweet Springs, Missouri
- Washington Park Library, St. Joseph, Missouri

7.0 LIST OF PREPARERS AND CONTRIBUTORS

Name	Education And Experience	Project Role
PREPARER		
U.S. Department of Agriculture / Rural Development		
Stephanie Strength	BS, Regional Development	Project Manager
U.S. Army Corps of Engineers		
Douglas Berka	BS, Agriculture-Soils 26 years experience	Cooperating Agency
URS Corporation		
Mary Hagerty, P.E.	BS, Geology and Civil Engineering MS, Geotechnical Engineering 21 years experience	Principal author
Ken Hagg, P.E.	BS, Civil Engineering 36 years experience	Air resources and impacts, Peer review
CONTRIBUTOR / REVIEWER		
U.S. Department of Agriculture / Rural Development		
Ayesh Abu-Eid	Power Supply Division	Reviewer
Richard Fristik	Environmental	Reviewer
David Hui	Power Supply Division	Reviewer
Wei Moy	Power Supply Division	Reviewer
Mark Plank	Engineering and Environmental	Reviewer
Dennis Rankin	Environmental	Reviewer
Steven Slovikosky	Power Supply Division	Reviewer
Victor Vu	Power Supply Division	Reviewer
URS Corporation		
Richard Bird, PE	BS, Civil Engineering MS, Geotechnical Engineering 40 years experience	Groundwater and wells technical review
Mark Felton, CPSS, PWS, AICP, CPAg	BS, Agriculture-Agronomy 23 years experience	Wetlands
Robert Greene	BS, Environmental Science 25 years experience	Noise technical review
Gregg Hagerty	BS, Civil Engineering 15 years experience	Technology alternatives, mercury risk assessment
Stephen Jenkins	BS, Chemical Engineering 30 years experience	Technology alternatives, especially IGCC
Dave Kocour	BGS, Environmental Studies 21 years experience	Socioeconomics and environmental justice technical review

Name	Education And Experience	Project Role
Joe Kuebler	BS, Chemical Engineering 32 years experience	Peer review
David Lamoree	BS, Chemical Engineering	Air resources and impacts
Rachel Lyles	BS, 1996	GIS
Marion Skouby, PE	BS, Civil Engineering 40 years experience	Groundwater technical review
Jennifer Schwent	BS, Biology MS, Botany 10 years experience	Wetlands
Jim Orr	BS, Biology 20 years experience	Technical review of fisheries and wildlife, threatened and endangered species
Michelle Wernig	15 years experience	Technical editor

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9.0 GLOSSARY

Abiotic: Non-living or non-biological; includes chemical and physical environments and processes.

Acoustic environment: The totality of noise within a given area.

ACHP: See "Advisory Council on Historic Preservation".

Advisory Council on Historic Preservation: An independent federal agency that promotes the preservation, enhancement, and productive use of our nation's historic resources, and advises the President and Congress on national historic preservation policy.

Aesthetic resources: See "Visual resources".

Agency for Toxic Substances and Disease Registry (ATSDR): Based in Atlanta, Georgia, ATSDR is a federal public health agency of the U.S. Department of Health and Human Services. It serves the public by6 using science, taking public health actions, and providing health information to prevent harmful exposures and diseases related to toxic substances.

Air quality: The characteristics of the ambient air (all locations accessible to the general public) as indicated by concentrations of the six air pollutants for which national standards have been established, and by measurement of visibility in mandatory federal Class I areas.

Airshed: A geographic area where air pollutants from sources "upstream," or within a discrete atmospheric area of flow, are present in the air. While watersheds are actual physical features of the landscape, airsheds are determined using mathematical models of atmospheric deposition.

All-requirements power contract. A formal agreement between a power supply system and its member distribution systems. In this contract the distribution systems agree to purchase all their wholesale power needs from the power supply system at rates prescribed in the agreement and adjusted periodically to meet the power supply system's cost of providing the power.

Alluvial: Pertaining to sediments deposited by modern streams or rivers.

Alternatives analysis: What CEQ calls the "heart of the EIS;" the evaluation of the Proposed Action compared to all of the alternatives used to define the issues and provide a clear basis or choice among the options

Ambient air: Any unconfined portion of the atmosphere: open air, surrounding air.

American Society for Testing and Materials (ASTM): ASTM develops technical standards for industry worldwide.

Anhydrous ammonia: Synthetic ammonia used as a nitrogen fertilizer, it is the basis for the production of all nitrogen fertilizers as well as being a direct application material. It is made through a reaction between gas and nitrogen.

Anthropogenic: Of or caused by humans.

Aquifer: A layer of earth materials that can yield a usable quantity of water to wells.

Archeology: The scientific study, interpretation, and reconstruction of past human cultures from an anthropological perspective based on the investigation of surviving physical evidence of human activity and the reconstruction of related past environments.

Archeological resources: Any material of human life or activities that is at least 100 years old, and that is of archaeological interest.

Attainment area: An area considered to have air quality as good as or better than the National Ambient Air Quality Standards (NAAQS) as defined in the Clean Air Act (CAA). An area may be an attainment area for one pollutant and a non-attainment area for others.

Autism: A brain disorder that begins in early childhood and persists throughout adulthood; it affects three crucial areas of development: communication, social interaction, and creative or imaginative play.

Availability Factor. The amount of time that a plant is able to produce electricity over a certain period, divided by the amount of time in that period. (See also capacity factor.)

Average Daily Traffic (ADT): Daily number of vehicular movements (e.g., passenger vehicles, buses, and trucks) in both directions on a segment of roadway, averaged over a period less than a year.

Baghouse: An enclosed structure that uses filter bags to help remove sulfur dioxide, fly ash, and other particulates from flue and other exhaust gases.

Base flood: The flood having a one percent chance of being equaled or exceeded in any given year. This is the regulatory standard also referred to as the "100-year flood." The base flood is the national standard used by the NFIP and all federal agencies for the purposes of requiring the purchase of flood insurance and regulating new development. Base Flood Elevations (BFEs) are typically shown on Flood Insurance Rate Maps (FIRMs).

Base Flood Elevation (BFE): The computed elevation to which floodwater is anticipated to rise during the base flood. Base Flood Elevations (BFEs) are shown on Flood Insurance Rate Maps (FIRMs) and on the flood profiles.

Base load: The minimum demands of electricity on a power station over a given period of time; the amount of electricity required to operate a plant continuously, day and night, all year long.

Baseload Plant. A plant, usually housing high-efficiency steam-electric units, which is normally operated to take all or part of the minimum load of a system, and which consequently produces electricity at an essentially constant rate and runs continuously. These units are operated to maximize system mechanical and thermal efficiency and minimize system operating costs.

Berm: A curb, ledge, wall or mound used to contain water, separate materials, and/or prevent the spread of contaminants.

Best management practices (BMPs): Methods that have been determined to be the most effective, practical means of preventing or reducing pollution from non-point sources, including construction sites.

BFE: See "Base Flood Elevation".

Bioaccumulation/ biomagnifications: The collection or amplification of a substance in a biological system; the increase in tissue concentration of

bioaccumulated chemical as the chemical passes up through two or more trophic levels.

Biogas: Gas, typically rich in methane, that is produced by the fermentation of organic matter such as manure under anaerobic conditions.

Blowdown: Removal of liquids or solids from a process, a storage vessel, or an evaporative system by the use of pressure to reduce mineral concentration that can cause scaling.

Burlington Northern and Santa Fe (BNSF) Railway: Headquartered in Fort Worth, Texas, BNSF is one of the largest railroad networks in North America. It was formed in 1996 when the Atchison, Topeka and Santa Fe Railway was merged into the Burlington Northern Railroad.

Busbar cost: The wholesale cost to generate power at a plant.

Capacity Factor. The amount of electricity that a plant produces over a period of time, divided by the amount of electricity it could have produced if it had run at full power over that time period.

Cave: A natural cavity beneath the earth's surface. Caves are formed when slightly acidic water combines with limestone or dolomitic rock, and dissolves the rock, creating a cavity.

Coal Combustion Product (CCP): Large-volume, non-hazardous waste products resulting from combustion of coal at power plants; CCPs that are disposed of in landfills, surface impoundments, or used as mine backfill, are regulated under subtitle D of the Resource Conservation and Recovery Act, and are thus subject to significantly stricter federal regulation than reused CCPs.

Co-firing: The practice of introducing biomass in high-efficiency, coal-fired boilers as a supplemental energy source.

Collector well: A well consisting of a hollow cylindrical concrete caisson that is sunk into the ground from which horizontal well screen laterals project into the surrounding aquifer that allow water to enter the well.

Combined Cycle: An electric generating technology in which electricity is produced from otherwise lost waste heat exiting from one or more gas (combustion) turbines. The exiting heat is routed to a conventional boiler or to a heat recovery steam generator for utilization by a steam turbine in the production of electricity. This process increases the efficiency of the electric generating unit.

Combustion: Burning. Many important pollutants, such as sulfur dioxide, nitrogen oxides, and particulates (PM-10) are combustion products of the burning of fuels such as coal, oil, gas and wood.

Community (in reference to NFIP): Any state, or area or political subdivision thereof, or any Indian tribe or authorized tribal organization or Alaska Native village or authorized native organization, which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction.

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS): Contains information on hazardous waste sties, potentially hazardous waste sites, and remedial activities across the nation, including existing and potential NPL sites.

Contamination: Introduction into water, air, and soil of microorganisms, chemicals, toxic substances, wastes, or wastewater in a concentration that makes the medium unfit for its next intended use.

Contour: An imaginary line of constant elevation on the ground surface. The corresponding line on a map is called a "contour line".

Criteria: Standards, rules, or tests on which a judgment or decision may be based.

Criteria air pollutants: A group of 6 common air pollutants regulated by EPA on the basis of criteria (information on health and/or environmental effects of pollution) and for which NAAQS have been established. In general, criteria air pollutants are widely distributed over the country. They are: PM, carbon monoxide (CO), sulfur dioxide (SO_2), ozone (O_3), nitrogen dioxide (NO_2), and lead (Pb).

Cultural resources: Any building, site, district, structure, object, data, or other material significant in history, architecture, archeology, or culture. Cultural resources include: historic properties as defined in the National Historic Preservation /Act (HNPA), cultural items as defined in the Native American Graves Protection and Repatriation Act (NAGPRA), archeological resources as defined in the Archeological Resources Protection Act (ARPA), sacred sites as defined in Executive Order 13007, *Protection and Accommodation of Access to "Indian Sacred Sites,"* to which access is provided under the American Indian Religious Freedom Act (AIRFA), and collections.

Cumulative impacts: Impact on the environment that 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 actions. Effects resulting from individually minor but collectively significant actions taking place over a period of time.

dBA (A-weighted decibel): The unit measurement of sound level calculated by taking ten times the common logarithm of the ration of the magnitude of the particular sound pressure to the standard reference sound pressure of 20 micropascals and its derivatives.

Decibel (dB): The A-scale sound level is a quantity, in decibels, read from a standard sound-level meter with A-weighting circuitry. The A-scale weighting discriminates against the lower frequencies according to a relationship approximating the auditory sensitivity of the human ear. The A-scale sound level measures approximately the relative "noisiness" or "annoyance" of many common sounds.

Detritus: Minute fragments of plant parts found on the soil surface.

Discharge: The volume of fluid plus suspended sediment that passes a given point within a given period of time.

Dissolved Oxygen: An amount of oxygen dispersed in water, usually expressed as mg/L; DO sustains the lives of fish and other aquatic organisms; cold and flowing water usually contains more DO than worm, stagnant water.

Dominant Species: A plant species that exerts a controlling influence on or defines the character of a community.

Drained: A condition in which ground or surface water has been reduced or eliminated from an area by artificial means.

Drawdown: The change in groundwater level that results from pumping. It is determined from the difference between the depth to the groundwater surface at a given time after pumping has started and the depth to the groundwater surface prior to the start of pumping.

Electric load: The combined electrical needs of all units in a system.

Emergent plant: A rooted herbaceous plant species that has parts extending above water surface.

Endangered species: A species that is threatened with extinction throughout all or a significant portion of its range.

Entrainment (streams): The incidental trapping of fish and other aquatic organisms in the water, for example, used for cooling electrical power plants or in waters being diverted for irrigation or similar purposes.

Environment: The total surroundings of an organism, including both non-living (abiotic) and living (biotic) components, that is, other plants and animals as well as those of its own kind.

Environmental assessment: A concise public document which serves to briefly provide sufficient evidence and analysis for determining whether to prepare an EIS [environmental impact statement] or a Finding of No Significant Impact (FONSI) in compliance with NEPA.

Environmental Site Assessment: Provides a good general indication of the past and existing conditions on a site that could indicate a recognized environment condition (i.e., contamination).

Farmland Protection Policy Act (FPPA): A federal law that aims to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to non-agricultural uses. It assures that,

to the extent possible, federal programs are administered to be compatible with state, local, and private programs and policies to protect farmland.

Federal Aviation Administration (FAA): Federal agency primarily responsible for the advancement, safety and regulation of civil aviation in the United States (U.S.).

Fill material: Any material placed in an area to increase surface elevation.

FIRM: See "Flood Insurance Rate Map".

Flood Insurance Rate Map (FIRM): The official map of a community on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community.

Flood zones: Flood hazard areas identified on the Flood Insurance Rate Map are identified as a Special Flood Hazard Area (SFHA). SFHA is defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. SFHAs are labeled as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. Moderate flood hazard areas, labeled Zone B or Zone X (shaded) are also shown on the FIRM, and are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are labeled Zone C or Zone X (unshaded).

Flooded: A condition in which the soil surface is temporarily covered with flowing water from any source, such as streams overflowing their banks, runoff from adjacent or surrounding slopes, inflow form high tides, or any combination of sources.

Floodway: A "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations. For streams and other watercourses where FEMA

has provided Base Flood Elevations (BFEs), but no floodway has been designated, the community must review floodplain development on a case-by-case basis to ensure that increases in water surface elevations do not occur, or identify the need to adopt a floodway if adequate information is available.

Flora: A list of all plant species that occur in an area.

Flue gas: The air coming out of a chimney after combustion; it can include nitrogen oxides, carbon oxides, water vapor, sulfur oxides, particles and many chemical pollutants.

Flue gas desulfurization: Removes PM and SO_2 by producing contact between the exhaust gas and a scrubbing slurry (generally lime or limestone). Mounted horizontal plates facilitate the transport of the slurry, whose contact with the exhaust gas forms a wet mixture of calcium sulfite and sulfate.

Fly ash: Non-combustible residual particles expelled by flue gas.

Frequency (inundation or soil saturation): The periodicity of coverage of an area by surface water or soil saturation. It is usually expressed as the number of years (e.g. 50 years) the soil is inundated or saturated at least once each year during part of the growing season per 100 years or as 1-, 2-, 5-year, etc., inundation frequency.

Fugitive dust: Particles lifted into the ambient air due to man-made and natural activities such as the movement of soil, vehicles, equipment, blasting, and wind. This excludes PM emitted directly from the exhaust of motor vehicles and other internal combustion engines.

Gas Turbine Plant. A plant in which the electricity is produced by a gas turbine (typically of an air compressor, one or more combustion chambers, where liquid or gaseous fuel is burned and the hot gases are passed to the turbine and where the hot gases expand to drive the generator and are then used to run the compressor).

Gasification: A method of treating coal or other carbon containing solids or liquids to produce combustible gas that can be collected and burned to generate power or processed into chemicals and fuels.

Generating capacity: The total amount of electrical power that a utility can produce at any one time, usually measured in megawatts; three types of generating capacity include a base load, an intermediate load, and a peaking capacity.

Geothermal resources: Internal heat of the earth when used as a source of energy, it is usually contained in underground reservoirs of steam, hot water, and hot dry rocks.

Glacial-Fluvial deposits: Earth materials that have been deposited or formed by either the action of glaciers or by streams or rivers, or sediments formed by glaciers and re-deposited by streams.

Groundwater: Water in the porous rocks and soils of the earth's crust; a gratuitous proportion of the total supply of fresh water.

Growing season: The portion of the year when soil temperatures at 19.7 inches below the soil surface are higher than biologic zero (5° C) (US Department of Agriculture - Soil Conservation Service 1985).

Habitat: The environment occupied by individuals of a particular species, population, or community.

Hazardous substances: Solid or liquid materials, which may cause or contribute to mortality or serious illness by virtue of physical and chemical characteristics, or pose a hazard to human health or the environment when improperly managed, disposed of, treated, stored, or transported.

Hazardous waste: A waste or combination of wastes which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either cause, or significantly contribute to an increase in mortality or an increase in serious, irreversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Haze: An atmospheric aerosol of sufficient concentration to be visible. The particles are too small to see individually, but reduce visual range by scattering light.

Heat: The transfer of energy from one object at a higher temperature to another object at a lower temperature.

Heavy metals: Metallic elements like mercury, lead, cadmium, arsenic, copper and zinc that can be harmful pollutants when they enter air, soil, and water.

Historic Property: As defined by the NHPA, a historic property or historic resource is any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP), including any artifacts, records, and remains that are related to and located in such properties. The term also includes properties of traditional religious and cultural importance (traditional cultural properties), which are eligible for inclusion in the NRHP as a result of their association with the cultural practices or beliefs of an Indian tribe or Native Hawaiian organization.

Hydraulic Conductivity: A measure of the permeability of a porous media. Specifically it is defined as the volume of water that can flow through a unit cross section of a media under a unit hydraulic gradient. It has units of a velocity and can be expressed in terms of feet per day (ft/day) or in gallons per day per square foot (gpd/ft^2).

Hydric soil: A soil that is saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (US Department of Agriculture-Soil Conservation Service 1985). Hydric soils that occur in areas having positive indicators of hydrophytic vegetation and wetland hydrology are wetland soils.

Hydroelectric: Related to electric energy produced by moving water (i.e. through a dam on a river that stores water in a reservoir).

Hydrology: The science dealing with the properties, distribution, and circulation of water.

Hydrophytic vegetation: The sum total of macrophytic plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. When hydrophytic vegetation comprises a community where indicators of hydric soils and wetland hydrology also occur, the area has wetland vegetation.

Impairment: An adverse impact on a resource or a value (i.e. when a significant adverse impact reaches the level of impairing a national park, it is prohibited under the Organic Act of 1916).

Intermediate Load. The range from base load to a point between base load and peak. This point may be the midpoint, a percent of the peakload, or the load over a specified time period.

Karst: A landscape characterized by the presence of caves, springs, sinkholes and losing streams, created as groundwater dissolves soluble rock such as limestone or dolomite.

Levee: A natural or man-made feature of the landscape that restricts movements of water into or through and area.

Levelized cost: The present value of the total cost of building and operating a generating plant over its economic life, converted to equal annual payments; costs are levelized (adjusted to remove the impact of inflation) in real dollars.

Limestone: A sedimentary rock composed of calcium carbonate; a rock of marine origin derived from the lime mud and ooze that accumulated on calm, shallow sea floors.

Losing stream: A surface stream that loses a significant amount of its flow to the subsurface through bedrock openings.

Macrophyte: Any plant species that can be readily observed without the aid of optical magnification. This includes all vascular plant species and mosses (e.g., Sphagnum spp.), as well as large algae (e.g. Chara spp., kelp).

Man-induced wetland: Any area that develops wetland characteristics due to some activity (e.g. irrigation) of man.

Mean sea level: A datum, or "plane of zero elevation", established by averaging all stages of oceanic tides over a 19-year tidal cycle or "epoch". This plane is corrected for curvature of the earth and is the standard reference for elevations on the earth's surface. The correct term for mean sea level is the National Geodetic Vertical Datum (NGVD).

Megawatthour (MWh). One million watts delivered for one hour.

Mesophytic: Any plant species growing where soil moisture and aeration conditions lie between extremes. These species are typically found in habitats with average moisture conditions, neither very dry nor very wet.

Methylation: Conversion of mercury (Hg) into methylmercury (CH_3Hg) through biotic (living) or abiotic (non-living) processes in the environment.

Metropolitan Statistical Area (MSA): As defined by the federal Office of Management and Budget, an MSA is an urban area that meets specified size criteria: either it has a core city of at least 50,000 inhabitants within its corporate limits, or it contains an urbanized area of at least 50,000 inhabitants and has a total population of at least 100,000. The Great Falls MSA is coincident
with Cascade County.

Mitigation: A method or action to reduce or eliminate adverse program impacts.

Monitoring (monitor): Systematically observing, recording, or measuring some environmental attribute, such as air quality or water quality, or ascertaining compliance with a given law, regulation, or standard. For example, measurement of air pollution is referred to as monitoring. EPA, state and local agencies measure the types and amounts of pollutants in the ambient air. The 1990 CAA Amendments require certain large polluters to perform enhanced monitoring to provide an accurate picture of how much pollution is being released into the air. The 1990 CAA requires states to monitor community air in polluted areas to check on whether the areas are being cleaned up according to schedules set out in the law.

Mottles: Spots or blotches of different color or shades of color interspersed within the dominant color in a soil layer, usually resulting from the presence or periodic reducing soil conditions.

MSA: See "Metropolitan Statistical Area".

National Environmental Policy Act (NEPA): Establishes procedures that federal agencies must follow in making decisions on federal actions that may

impact the environment. Procedures include evaluation of environmental effects of proposed actions, and alternatives to proposed actions, involvement of the public and cooperating agencies.

National Ambient Air Quality Standards (NAAQS): Standards established at the federal level that define the limits for airborne concentrations of designated "criteria" pollutants (e.g. nitrogen dioxide, sulfur dioxide, CO, PM, O_3, and lead) to protect public health with an adequate margin of safety (primary standards) and to protect public welfare, including plant and animal life, visibility, and materials (secondary standards). States may establish more stringent standards if they want to do so.

National Flood Insurance Program (NFIP): The NFIP is a federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages.

National Priorities List (NPL): List of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the U.S. and its territories; sites listed in the NPL also are known as Superfund sites.

National Register of Historic Places (NHRP): The nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service.

Native vegetation: Plant life that occurs naturally in an area without agriculture or cultivation efforts.

Navigable waters: The Waters of the United States, including the territorial seas; all waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide, as defined by Title 40 of the Code of Federal Regulations, Section 110.1 (40 CFR 110.1).

NEPA: See "National Environmental Policy Act".

Net Generation. Gross generation minus plant use from all electric utility owned plants. The energy required for pumping at a pumped-storage plant is regarded as plant use and must be deducted from the gross generation.

Neurotoxicity: Having the capability of harming nerve tissue.

NFIP: See "National Flood Insurance Program".

Noise: Sound that is perceived by humans as annoying and unwanted.

Non-attainment area: An area that has been designated by the U.S. Environmental Protection Agency and the appropriate state air quality agency as exceeding one or more National Ambient Air Quality Standards.

Non-hydric soil: A soil that has developed under predominantly aerobic soil conditions. These soils normally support mesophytic or xerophytic species.

No-rise Certification for Floodways: Any project in a floodway must be reviewed to determine if the project will increase flood heights. An engineering analysis must be conducted before a permit can be issued. The community's permit file must have a record of the results of this analysis, which can be in the form of a No-rise Certification. This No-rise Certification must be supported by technical data and signed by a registered professional engineer. The supporting technical data should be based on the standard step-backwater computer model used to develop the 100-year floodway shown on the Flood Insurance Rate Map (FIRM) or Flood Boundary and Floodway Map (FBFM).

NPL: See "National Priorities List".

NRHP: See "National Register of Historic Places".

Organic soil: soil is classified as an organic soil when it is: (1) saturated for prolonged periods (unless artificially drained) and has more than 30-percent organic matter if the mineral fraction is more than 50-percent clay, or more than 20-percent organic matter if the mineral fraction has no clay; or (2)

never saturated with water for more than a few days and having more than 34-percent organic matter.

Palustrine emergent wetland: Classification of the U.S. Fish and Wildlife Service for non-tidal wetlands dominated by trees, shrubs, or persistent emergent vegetation. Palustrine emergent wetlands include vegetated wetlands traditionally called by such names as marsh, swamp, bog, fen, and prairie. They also include small, shallow, permanent or intermittent water bodies often called ponds.

Particulate matter (PM): Solid or liquid matter suspended in the atmosphere.

Peak Demand. The maximum load during a specified period of time.

Peak Load Plant. A plant usually housing gas turbines; diesels; or pumped-storage hydroelectric equipment normally used during the peak-load periods.

Peaking Capacity. Capacity of generating equipment normally reserved for operation during the hours of highest daily, weekly, or seasonal loads. Some generating equipment may be operated at certain times as peaking capacity and at other times to serve loads on an around-the-clock basis.

Photochemical: Of or pertaining to chemical action of light, or produced by it.

Photovoltaic: Converting light into electricity; semiconductor devices that convert sunlight into direct current electricity (i.e. solar cells).

Plant community: All of the plant populations occurring in a shared habitat or environment.

Plume: A continuous emission from a point source of contamination that has a starting point and a noticeable pathway.

Poorly drained: Soils that commonly are wet at or near the surface during a sufficient part of the year that field crops cannot be grown under natural conditions.

Potable: A liquid, usually water, which is drinkable.

Powder River Basin: An area containing the world's largest single deposit of low-sulfur coal, located in southeastern Montana and northeastern Wyoming.

Power purchase agreement: The off-take contract from a large customer to buy the electricity generated by a power plant.

Pressure Transducer: A device that generates an electrical signal that varies in proportion to the amount of pressure that the device is exposed to. The electrical signal can be converted to a digital signal that can be stored on a computer as a record of the pressures that the transducer is exposed to, such as head pressures (groundwater levels) within a well.

Pulverized coal: A coal that has been crushed to a fine dust in a grinding mill. It is blown into the combustion zone of a furnace and burns very rapidly and efficiently.

Reclamation/ remediation: The process of restoring an area to an acceptable pre-existing condition; an action to correct damage to the environment (i.e. after a power plant is decommissioned or shut down).

Relief: The change in elevation of a land surface between two points; collectively, the configuration of the earth's surface, including such features as hills and valley.

Rhizosphere: The zone of soil in which interactions between living plant roots and microorganisms occur.

Routine wetland determination: A type of wetland determination in which office data and/or relatively simple, rapidly applied onsite methods are employed to determine whether or not an area is a wetland.

Runoff: The non-infiltrating water entering a stream or other conveyance channel shortly after a rainfall.

Sample plot: An area of land used for measuring or observing existing conditions.

Saturated soil conditions: A condition in which all easily drained voids (pores) between soil particles in the root zone are temporarily or permanently filled with water to the soil surface at pressures greater than atmospheric.

Scenic resources: See "Visual resources".

Scoping: Planning process that solicits people's and "stakeholders'" opinions on the value of a park, issues facing a park, and the future of a park. Also used in the NEPA process at the outset of preparing an EA or an EIS to help determine the scope of the study and the major issues that merit investigation and analysis.

Sediment: Particles derived from rock or biological sources that have been transported by water.

Selective catalytic reduction: A non-combustion control technology that converts nitrogen oxides (NO_X) into molecular nitrogen and water by injecting a reducing agent (i.e. ammonia) into the flue gas in the presence of a catalyst.

Sensitive receptor: Areas defined as those sensitive to noise, such as hospitals, residential areas, schools, outdoor theaters, and protected wildlife species.

SFHA: See "Special Flood Hazard Area".

SHPO: See "State Historic Preservation Officer".

Siltation: Deposition of fine mineral particles (silt) on the beds of streams or lakes.

Sinkhole: A rounded depression in the landscape formed when an underground cavity collapses.

Soil: Unconsolidated mineral and organic material that supports, or is capable of supporting, plants, and which has recognizable properties due to the integrated effect of climate and living matter acting upon parent material, as conditioned by relief over time.

Special Flood Hazard Area (SFHA): The land area covered by the floodwaters of the base flood is the Special Flood Hazard Area (SFHA) on NFIP maps. The SFHA is the area where the NFIP's floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. The SFHA includes Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, and V.

Specific Capacity: A measure of the productivity of a well. It is determined by dividing the pumping rate of a well by the amount of drawdown. It is typically expressed in units of gallons per minute per foot of drawdown (gpm/ft).

Specific Conductance: A measure of the ability of water to conduct electricity. It roughly correlates to the total dissolved concentration of ionic constituents (chemicals that form charged particles when dissolved) in the water, and is thus a general indicator of water quality. Pure water has very low specific conductance. As the amount of ionic constituents dissolved in the water increases, the specific conductance increases. It is expressed in units of microsiemens per centimeter (µS/cm) or the equivalent unit micromhos per centimeter (µmhos/cm)

Source: Any place or object from which pollutants are released. A source can be a power plant, factory, dry cleaning business, gas station or farm. Cars, trucks and other motor vehicles are sources, and consumer products and machines used in industry can be sources too. Sources that stay in one place are referred to as stationary sources; sources that move around, such as cars or planes, are called mobile sources.

Species: All organisms of a given kind; a group of plants or animals that breed together but are not bred successfully with organisms outside their group.

Spring: A natural discharge of water from a rock or soil to the surface.

State Historic Preservation Officer (SHPO): Appointed under the authority of the National Historic Preservation Act of 1966, the State Historic Preservation Officer is the official in each state and territory charged with administering national and state historic preservation program at the state level.

Storativity: A measure of an aquifer's ability to store water. Specifically it is the volume of water that an aquifer stores or releases per unit surface area of the aquifer per unit change in hydraulic head. Storativity is a unitless value.

Storm water: Runoff water resulting from precipitation.

Sub-bituminous coal: A coal with a heating value between bituminous (soft; high in carbon) and lignite (young; low-grade; low in sulfur) with low-fixed carbon and high percentages of volatile matter and moisture. Coal mined in the Power River Basin of Wyoming is an example of sub-bituminous coal.

Topography: The configuration of a surface, including its relief and the position of its natural and man-made features.

Toxicity: A measure of how toxic or poisonous something is.

Tree: A woody plant plan 3.0 in. in diameter at breast height, regardless of height (exclusive of woody vines).

Turbidity: A measure of water clarity; a measure of the amount of suspended solids (usually fine clay or silt particles) in water and thus the degree of scattering or absorption of light in the water.

Viewshed: Subunits of the landscape where the scene is contained by topography, similar to a watershed.

Visual resources: The quality of the environment as perceived through the visual sense; visual resources are evaluated by comparing project features with the major features in the existing landscape; denotes an interaction between a human observer and the landscape he or she is observing.

Volatile Organic Compounds (VOCs): Any organic compound that participates in atmospheric photochemical reactions. Some compounds are specifically listed as exempt due to their having negligible photochemical reactivity. [40 CFR 5 1.100.] Photochemical reactions of VOCs with oxides of nitrogen and sulfur can produce O_3 and PM.

Waste-to-energy: A range of processes associated with municipal or industrial waste where the waste is burned, gasified or digested at a high

temperature. Energy is recovered from these processes (usually in the form of heat) and is reclaimed to produce steam and/or generate electricity.

Water table: The upper surface of groundwater or that level below which the soil is saturated with water. It is at least 6 in. thick and persists in the soil for more than a few weeks.

Well Development: The process of removing fine-grained materials from around a well screen to ensure that the screen is open to the aquifer and to maximize the well's performance. Well development is typically accomplished by pumping or surging the well. Pumping for development can be accomplished by air-lifting, a method in which a pipe is installing into the well through which compressed air is injected. The air forces water up out of the well casing carrying the fine-grained materials that can pass through well screen along with it.

Well Screen: Part of a well in an unconsolidated aquifer that is designed to maximize the amount of water that enters the well while minimizing the amount of sand or fine-grained materials that can enter the well. A well screen can be simply pipe with numerous slots cut through it. Wire-wrapped well screen provides the maximum amount of open area. It is constructed from a number of metal rods running the length of the screen around which a wire is wrapped and attached by welding. A gap is left between successive wraps of the wire to form a continuous slot that allows the entrance of water into the screen. For either cut slot or wirewrapped well screen, the size of the slot opening is selected based on the grain-size distribution of the aquifer materials.

Wetland determination: The process or procedure by which an area is adjudged a wetland or non-wetland.

Wetland hydrology: The sum total of wetness characteristics in areas that are inundated or have saturated soils for a sufficient duration to support hydrophytic vegetation.

Wetland plant association: Any grouping of plant species that recurs wherever certain wetland conditions occur.

Wetland soil: A soil that has characteristics developed in a reducing atmosphere, which exists when periods of prolonged soil saturation result in

anaerobic conditions. Hydric soils that are sufficiently wet to support hydrophytic vegetation are wetland soils.

Wetland vegetation: The sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present. Hydrophytic vegetation occurring in areas that also have hydric soils and wetland hydrology may be properly referred to as wetland vegetation.

Wetlands: Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Xerophytic: A plant species that is typically adapted for life in conditions where a lack of water is a limiting factor for growth and/or reproduction. These species are capable of growth in extremely dry conditions as a result of morphological, physiological, and/or reproductive adaptation.

Zone A (in reference to FEMA FIRMs): Areas subject to inundation by the 1-percent-annual chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Zones AE and A1 through 30 (in reference to FEMA FIRMs): Areas subject to inundation by the 1-percent-annual chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

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