[6450-01-P]

DEPARTMENT OF ENERGY

Record of Decision and Floodplain Statement of Findings

Kemper County IGCC Project, Kemper County, MS

AGENCY: U.S. Department of Energy

ACTION: Record of Decision and Floodplain Statement of Findings

SUMMARY: The Department of Energy (DOE) prepared an Environmental Impact Statement (EIS) (DOE/EIS-0409) to assess the environmental impacts associated with a proposed project designed, constructed, operated, and owned by Mississippi Power, a Southern Company subsidiary. The U.S. Army Corps of Engineers (USACE) was a cooperating agency in the preparation of this EIS. The project would demonstrate advanced power generation systems using Integrated Gasification Combined Cycle (IGCC) technology at an undeveloped site in Kemper County, MS. DOE's proposed action has two components: first, to provide cost-shared financial assistance and, second, to issue a loan guarantee. After careful consideration of the potential environmental impacts and other factors such as program goals and objectives, DOE has decided that it will provide, through a cooperative agreement with Southern Company Services (SCS), also a Southern Company subsidiary, $270 million in cost-shared funding under DOE's Clean Coal Power Initiative (CCPI) program for the project. A separate decision would be made regarding the loan guarantee; DOE would announce that decision in a subsequent Record of Decision.

ADDRESSES: The Final EIS is available on the DOE National Environmental Policy Act (NEPA) website at http://www.nepa.energy.gov/1445.htm and on the DOE National Energy Technology Laboratory (NETL) website at http://www.netl.doe.gov/technologies/coalpower/cctc/ccpi/bibliography/demonstration/adv-gen/ccpi_285-mw.html. The Record of Decision (ROD) will be available on both websites soon. Copies of the Final EIS and this ROD may be obtained by contacting Mr. Richard A. Hargis, Jr., National Environmental Policy Act (NEPA) Document Manager, U.S. Department of Energy, National Energy Technology Laboratory, 626 Cochrans Mill Road, P.O. Box 10940, Pittsburgh, PA 15236-0940; telephone: 412-386-6065; or e-mail: Kemper-EIS@netl.doe.gov.

FOR FURTHER INFORMATION CONTACT: To obtain additional information about the project or the EIS, contact Mr. Richard A. Hargis, Jr. at the addresses provided above. For general information on the DOE NEPA process, contact Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance (GC-54), U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585; telephone: 202-586-4600; or leave a toll-free message at 1-800-472-2756.

SUPPLEMENTARY INFORMATION: DOE prepared this ROD and Floodplain Statement of Findings pursuant to Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA [40 Code of Federal Regulations (CFR) Parts 1500-1508], DOE NEPA regulations (10 CFR Part 1021) and DOE's Compliance with Floodplain and Wetland Environmental Review Requirements (10 CFR

Part 1022). This ROD is based on DOE's Final EIS for the Kemper County IGCC Project (DOE/EIS-0409, May 2010) and other program considerations.

Background and Purpose and Need for Agency Action

Public Law 107-63, enacted in November 2001, first provided funding for the Clean Coal Power Initiative (CCPI) program, a federal program to accelerate the commercial readiness of advanced technologies in existing and new coal-based power plants. The program encompasses a broad spectrum of commercial-scale demonstrations that target today's most pressing environmental challenges, including reducing mercury and greenhouse gas (GHG) emissions by boosting the efficiency at which coal is converted to electricity or other energy forms. When integrated with other DOE initiatives, the program will help the nation successfully commercialize advanced power systems that will produce electricity at greater efficiencies, release almost no emissions, create clean fuels, and employ carbon dioxide (CO_2) management capabilities.

The purpose of DOE's proposed action under the CCPI program is to demonstrate the feasibility of the Transport Integrated Gasification (TRIG™) IGCC technology at a size that would be attractive to utilities for commercial operation. DOE, Southern Company, Kellogg Brown & Root LLC, and other industrial proponents have been developing this technology since 1996. It is cost-effective when using low-heat content, high moisture, or high-ash content coals, including lignite. These coals constitute approximately one-half of proven coal reserves. A successful demonstration would generate technical, environmental, and financial data to confirm that the technology can be implemented at a commercial scale. Financial assistance from DOE would reduce the cost and financial risk in demonstrating that the technology is ready for commercialization.

The purpose of DOE's proposed action with regard to the federal loan guarantee is to encourage early commercial use in the United States of new or significantly improved energy technology and to reduce or eliminate emissions of GHGs and other air pollutants pursuant to Title XVII of the Energy Policy Act of 2005 (EPAct).

Two principal needs are addressed by DOE's proposed actions. First, the project would satisfy the responsibility Congress imposed on DOE to demonstrate advanced coal-based technologies that can generate clean, reliable, and affordable electricity in the United States. Second, with regard to the federal loan guarantee, this project would fulfill EPAct's objective of assisting projects that "avoid, reduce, or sequester air pollutants or anthropogenic emissions of GHGs" and "employ new or significantly improved technologies as compared to technologies in service in the United States."

EIS Process

On September 22, 2008, DOE published a Notice of Intent (NOI) (73 FR 54569) to prepare the EIS and hold a public scoping meeting. DOE held a public scoping meeting in DeKalb, Mississippi, on October 14, 2008. The Department received oral responses at the meeting and other responses by comment card, mail, e-mail, and telephone from individuals, interested groups, and Federal, state, and local officials. On November 5, 2009, DOE published in the *Federal Register* (74 FR 57297) a Notice of Availability (NOA) for the Kemper County IGCC Project Draft EIS. The NOA invited comments on the Draft EIS. As part of the review process, DOE conducted a public hearing on December 1, 2009, in DeKalb, Mississippi. The public was encouraged to provide oral comments at the hearing and to submit written comments to DOE during a 45-day

comment period that ended December 21, 2009. DOE received numerous comments; many resulted from e-mail campaign efforts of two non-governmental organizations.

DOE issued the Final EIS and the Environmental Protection Agency (EPA) published a NOA in the *Federal Register* on May 21, 2010 (75 FR 28612). In the Final EIS, DOE responded to comments on the Draft EIS. Among the issues raised in these comments were concerns about (1) DOE's statement of purpose and need; (2) the range of alternatives considered; (3) air pollutant emissions, emissions controls, and air quality impacts; (4) emissions of GHG and climate change effects; (5) surface water quality and downstream effects on the Pascagoula River and Gulf of Mexico; (6) stream restoration following mining; (7) increases in flood elevations and effects on floodplains; (8) wetlands impacts and mitigation; (9) hydrologic impacts, especially on Okatibbee Lake; (10) groundwater impacts and effects on drinking water supplies; (11) noise impacts; (12) mining impacts, including soils, and land reclamation; (13) wildlife impacts, including threatened and endangered species; (14) risks to human health from criteria and hazardous air pollutants, including mercury deposition and bioaccumulation; (15) socioeconomic and environmental justice impacts; (16) traffic impacts; (17) land and right-of-way acquisition; and (18) effects on community resources.

Decision

DOE has decided to provide Mississippi Power with cost-shared funding of $270 million through a cooperative agreement with Southern Company Services to design, construct, and demonstrate the Kemper County IGCC Project.

Basis of Decision

DOE's decision is based on the importance of achieving the objectives of the Clean Coal Power Initiative and a careful review of the potential environmental impacts presented in the EIS. The project provides a significant opportunity to demonstrate a technology that can use the nation's abundant coal resources in a cost-effective and clean manner while reducing GHG emissions. The effective and clean use of domestic energy resources allows the United States to reduce its reliance on world markets for its energy supplies – reliance on these markets decreases national security. This technology also addresses concerns about the consequences of continuing to use fossil fuels without effectively managing their carbon emissions. The project incorporates controls that make its carbon emissions essentially equal to natural gas-based power generation. The key feature of the TRIG™ technology is its cost-effective use of low-rank coals, like Mississippi lignite, which constitutes nearly 50% of our nation's coal resource. DOE has reviewed and participated in the technology's development and believes that it is ready for commercial demonstration. Without this project, DOE would not have the opportunity to demonstrate this technology and make it available for the cost-effective and clean use of low rank coals.

The project would also have economic benefits to the region. Beyond the estimated combined construction payroll for the plant and mine of $145 million, there would be an estimated additional indirect benefit of $82 million and 186 additional jobs due to construction activities. The operation of the plant and mine would result in an estimated $25 million annual payroll, an indirect annual economic benefit of about $11.4 million, and approximately 97 new jobs.

This decision incorporates all practicable means to avoid or minimize environmental harm. DOE plans to verify the environmental impacts predicted in the EIS and the implementation of appropriate avoidance and mitigation measures.

Mitigation

DOE's decision incorporates measures to avoid or minimize adverse environmental impacts during the design, construction and demonstration of the project. DOE requires that the participants comply with all applicable federal, state, and local environmental laws, orders, and regulations. Mitigation measures beyond those specified in permit conditions will be addressed in a Mitigation Action Plan (MAP). DOE will prepare the MAP, consistent with 10 CFR 1021.331, which will explain how the mitigation measures will be planned, implemented and monitored. The MAP is an adaptive management tool; mitigation conditions in it would be removed if equivalent conditions are otherwise established by permit, license, or law, as compliance with permit, license or regulatory requirements are not considered mitigation activities subject to DOE control and are therefore not included in MAPs.

DOE will ensure that commitments in the MAP are met through management of the cooperative agreement, which requires that Southern Company Services fulfills the monitoring and mitigation requirements specified in this ROD. DOE will make copies of the MAP available for inspection in the appropriate locations for a reasonable time. Copies of the MAP and any annual reports required under the MAP will also be available upon written request.

Project Description and Location

The power plant would be located on an approximately 1,650-acre site in southwestern Kemper County. The mine and linear facilities (e.g., pipelines) would extend into several other counties. The power plant site and mine area are rural and sparsely populated. The electrical transmission lines and pipelines would also traverse mostly rural areas. Mississippi Power plans to acquire additional properties adjacent to the proposed power plant site for buffer areas. Approximately 1,400 acres of buffer areas immediately north and east of the site have been acquired, optioned, or identified for acquisition.

The IGCC plant consists of two major systems: lignite coal gasification and combined-cycle power generation. The gasification systems consist primarily of lignite handling, gasification, and syngas processing and cleanup. There are two lignite gasifiers. At full capacity, the gasifiers would convert an average of 13,800 tons per day of lignite into syngas (synthesis gas). The principal combined-cycle components include two combustion turbines (CTs), two heat recovery steam generators (HRSG), and a steam turbine. In a combined-cycle unit, fuel gas is combusted in CTs, and its hot exhaust gas is then used to heat water to drive a steam turbine. The reuse of the CTs' exhaust heat to power a steam turbine constitutes the combined-cycle approach, which increases the amount of electricity that can be generated from a given amount of fuel.

The proposed project would reduce sulfur dioxide (SO_2), nitrogen oxides (NOx), mercury, and particulate emissions by removing them from the syngas. The removal of nearly 100 percent of the fuel-bound nitrogen from the syngas prior to combustion in the gas CTs would result in appreciably lower NOx emissions compared to conventional coal-fired plants. The facility would have carbon capture systems sufficient to reduce

CO_2 emissions by approximately 67 percent by removing carbon from the syngas. The CO_2 would be compressed and piped offsite where it would be sold for beneficial use and geologic storage via enhanced oil recovery (EOR).

Connected actions are actions that are closely related to the proposed action and therefore are evaluated in the same EIS. The project's connected actions consist of construction and operation of a cooling water supply (i.e., reclaimed effluent from municipal wastewater treatment) pipeline, a natural gas pipeline, associated transmission lines and substations, CO_2 pipelines, and a lignite mine. North American Coal Company would construct and operate the mine. The mine would be located next to the power plant site. The mine would be the primary source of feedstock for the IGCC project. Approximately 4.3 million tons per year of lignite would be mined for up to 40 years. As many as 12,275 acres would be disturbed over the life of the mine. Actual mining—the uncovering and extraction of lignite—would disturb between 135 and 340 acres per year. After the first 3 to 5 years of mining, approximately the same acreage would be reclaimed each year as that newly disturbed.

Construction of the power plant would begin in 2010 and continue for 3.5 years. During construction, an average of 500 workers would be on the site, with approximately 1,150 workers required during the peak construction period. The plant's operational workforce would be approximately 90-105 employees.

Proposed Actions

DOE's proposed actions are to provide financial assistance and to issue a loan guarantee. The Congress established the CCPI program to accelerate commercial deployment of advanced technologies for generating clean, reliable, and affordable electricity in the

United States using abundant domestic reserves of coal. EPAct established the Federal Loan Guarantee Program to assist energy projects that employ innovative technologies.

DOE proposed providing an additional $270 million in financial assistance to the Kemper County project. It has already provided some funding ($23.5 million) to Southern Company Services for the preliminary design and definition of this project at a previous location. DOE's proposed action encompasses those activities that are eligible for this funding, including the construction of power plant components such as the gasification island, the combined-cycle power generation unit, and its auxiliary facilities.

In addition to providing financial assistance, DOE is considering issuing a loan guarantee. A separate ROD would be issued regarding the loan guarantee. If approved for a guarantee, a loan from the Federal Financing Bank would fund a portion of the plant's construction costs.

Alternatives

Congress directed DOE to pursue the goals of the CCPI Program by means of partial funding of projects owned and controlled by non-Federal sponsors. This statutory requirement places DOE in a much more limited role than if it were the owner and operator of the project. Here, the purpose of and need for DOE action is defined by the CCPI program (and enabling legislation, Public Law 107-63) and the Federal Loan Guarantee Program (and enabling legislation, EPAct). Given these programmatic purposes and needs, reasonable alternatives available to DOE prior to the selection of this project under the CCPI and Loan Guarantee Programs were other projects that applied to these programs and met their eligibility requirements. Other applications (and their potential environmental, safety and health impacts) were considered during the

evaluation and selection process. Pursuant to 10 C.F.R. § 1021.216, a synopsis of the environmental review and critique completed for the evaluation and selection process will be posted on the DOE NETL website at http://www.netl.doe.gov/technologies/coalpower/cctc/ccpi/bibliography/demonstration/adv-gen/ccpi_285-mw.html. Once the selection process was complete, the reasonable alternatives are limited to alternatives still under consideration by the proponents of a selected project and the no-action alternative.

The site for the Kemper County project was chosen by Mississippi Power based on a site selection process it had completed prior to seeking DOE funding for the project. It found that the only reasonable site was the Kemper County site based on the location of accessible lignite reserves near Mississippi Power's service territory, proximity to infrastructure, topography, environmental considerations, and available open space.

With regard to alternative power generation technologies, DOE considered other coal-based technologies in evaluating the proposals received under the CCPI solicitation. Other technologies (e.g., natural gas, wind power, solar energy, and conservation) would not achieve the CCPI program's goal of accelerating commercial deployment of advanced coal-based technologies. Other alternatives, such as reducing the size of the proposed project, were dismissed as unreasonable, since the size of the proposed project is related to Mississippi Power's projected need for power.

Under the proposed action alternative, DOE assessed the impacts of alternative water sources, alternative linear facility routes, and alternative levels of CO_2 capture. Route selection procedures were applied to all proposed linear facilities. These procedures

considered various route selection factors, such as making use of (or paralleling) existing rights-of-way and avoiding developed or sensitive areas.

The EIS evaluated a range of alternative levels of percentage CO_2 capture: 25, 50, 67, and greater than 67. After initially basing the design on 25-percent capture, designs were updated to target 50- and then 67-percent capture. The project DOE has decided to fund includes a capture rate of 67 percent. This higher rate will require more fuel to achieve the same net power output relative to a plant with 50-percent capture. Air quality impacts vary slightly between the 50- and 67-percent rates and some other differences would result (e.g., there would be small variations in outputs of by-products).

No-Action Alternative

Under the no-action alternative, DOE would not provide cost-shared funding for the design, construction, and demonstration of the proposed Kemper County IGCC Project, nor issue a loan guarantee. DOE considered the no-action alternative to be the same as the "no-build" alternative. However, without DOE participation, Southern Company and Mississippi Power could pursue two options. First, Mississippi Power could continue with the project without federal participation. DOE believes that option is unlikely, because the financial risks and costs of deploying a new type of IGCC power system are significant. In any event, if the proponents were to proceed with the project without DOE participation, the direct, indirect, and cumulative impacts would be essentially the same as DOE's proposed action. Second, the proponents could abandon the IGCC project and, instead, meet future energy and capacity needs from other sources. Under this scenario, the proposed IGCC facility would not be built. It is also likely that the lignite mine would not be built nor the linear facilities. As a consequence, none of the direct impacts

associated with the project would occur, whether adverse or beneficial. In addition, the opportunities for more rapid commercialization of the gasification technologies (alone or integrated with the combined-cycle facilities) would diminish, because utilities and industries tend to prefer known and demonstrated technologies. This outcome would not achieve the CCPI program's goal of accelerating commercial deployment of advanced coal-based technologies that can generate clean, reliable, and affordable electricity in the United States.

Potential Environmental Impacts and Mitigation Measures

In making its decision, DOE considered the environmental impacts of the proposed action and the no-action alternative on potentially affected environmental resource areas. These include: air quality; greenhouse gas emissions; geology and soils; surface waters; ground water; terrestrial ecology; aquatic ecology; floodplains; wetlands; land use; socioeconomics; environmental justice; transportation; waste management; recreation; aesthetics and visual resources; cultural and historic resources; noise; and human health and safety. The EIS also considered the impacts from these facilities combined with those from other past, present and reasonably foreseeable future actions (i.e., cumulative impacts). The following sections discuss the potential impacts in these areas.

Air Quality

Construction of the power plant would generate fugitive dust, engine emissions, and other emissions that would result in localized air quality impacts. Projected emissions from power plant operations are up to 590 tons per year (tpy) SO_2, 1,900 tpy NOx, 470 tpy particulate matter less than or equal to 10 micrometers in aerodynamic diameter (PM_{10}), 980 tpy carbon monoxide (CO), and lesser amounts of other pollutants. These emissions

would potentially contribute to an increase in pollutant concentrations ranging from approximately 3 to 15 percent of the National Ambient Air Quality Standards (NAAQS) and from 12 to 71 percent of Prevention of Significant Deterioration (PSD) Class II increments. Plant emissions would have insignificant impacts on the closest PSD Class I area, which is 225 km (140 miles) away. For estimation of ambient impacts, all PM_{10} from combustion sources was assumed to be less than 2.5 micrometers (i.e., $PM_{2.5}$). The power plant would also emit an estimated 1.8 to 2.6 million tpy of CO_2 annually, as well as small amounts of other pollutants (e.g., 55 tpy of sulfuric acid mist and less than 0.1 tpy of mercury). In addition to CO_2, much smaller emissions of other GHGs (e.g., nitrous oxide and methane) would be emitted from the IGCC plant and mine.

Construction and operation of the lignite mine would generate fugitive dust emissions from areas cleared to facilitate mining; fugitive dust emissions from clearing, mining, and grading an average of 275 acres per year for as many as 40 years; fugitive dust emissions from off-road trucks and other vehicles traveling on internal, unpaved roads; point source emissions of particulate matter from transfer points at the lignite handling facilities; and criteria and hazardous air pollutant emissions from combustion of gasoline and diesel fuel in construction and operating equipment. These emissions would have localized impacts.

During construction, use of modern, well-maintained machinery and vehicles meeting applicable emission performance standards would minimize emissions. Use of dust abatement techniques such as wetting soils, covering storage piles, and limiting operations during windy periods on unpaved, unvegetated surfaces would reduce airborne dust and resulting impacts. The distances of most construction-related activities from the nearest property boundary and residences would mitigate most potential impacts.

EPA recommended, and DOE requires as a condition of its decision to provide financial assistance, measures to minimize diesel exhaust emissions from construction and operating equipment. These measures include using low-sulfur diesel fuel, properly equipping and maintaining diesel-fueled equipment, properly training operators, and employing safe work practices.

Greenhouse Gas Emissions

Mississippi Power will design the IGCC facility to capture approximately 67 percent of the CO_2 that would otherwise be emitted. The captured CO_2 will be sent by pipeline for use in EOR. The project, operating at an 85-percent capacity factor (i.e., at full capacity), will emit approximately 1.8 million tpy of CO_2 while burning lignite coal and firing natural gas in the duct burners. It will also emit small amounts (approximately 91,000 tpy of CO_2 equivalents) of other GHGs.

Based on a study of life cycle GHG emissions from IGCC power systems DOE estimates that plant support operations, maintenance, and lignite mining could increase annual GHG emissions attributable to the operation of the generating station by approximately 130,000 tons (for a total of approximately 2.0 to 2.8 million tons annually). Total emissions of GHGs from construction activities will be approximately 430,000 tons of CO_2 equivalents (approximately 15 to 22 percent of 1 year's operating emissions). During its initial 6-month of operation, the plant may use coal delivered by truck from the Red Hills Mine. These temporary deliveries may result in an additional 4,400 tons of CO_2 emissions.

Most of the GHG emissions from coal-mining operations will result from combustion of diesel fuel in mining equipment and off-road vehicles. The annual emissions of CO_2 from

mining operations were estimated at approximately 45,000 tons. These emissions represent less than 2 percent of the annual project's emissions. DOE requires as a condition of its decision that the plant be designed and built to achieve 67 percent carbon capture and that the project proponents use best efforts to achieve 67 percent carbon capture during the demonstration period.

Surface Waters

No new process wastewater discharges are anticipated from the power plant. The plant will use reclaimed effluent from two publicly owned treatment works in Meridian, Mississippi, which will reduce flows in Sowashee Creek but also remove a source of pollutants that contribute to the creek's impaired status. As many as 32 miles of perennial stream channels and 24 miles of intermittent stream channels will be removed temporarily by construction and lignite extraction at the adjacent mine. The USACE maintains the avoidance, minimization and mitigation process in accordance with Section 404 of the CWA which includes the permit application evaluation process. This process includes implementation of the USACE stream evaluation process including an adverse impact analysis. If authorized by the USACE and upon completion of all mining and reclamation, the existing drainage patterns will be restored. The USACE will determine through its minimization evaluation process the number and length of streams, if any, to be mined and diverted. Aquatic communities in streams in Kemper County not physically disturbed by the mining operations would not be adversely affected based on the data collected at the Red Hills Mine. The water budget of Okatibbee Lake would not change significantly, meaning that the total volume of water flowing through the lake should remain within its historical range. The use of sedimentation ponds for water quality

treatment will result in decreased peak flows following storm events. Water quality standards are not expected to be exceeded due to mine discharges.

DOE requires, as a condition of its decision, that upstream and downstream water quality monitoring be conducted at appropriate locations in the mine area and in Okatibbee Lake to assess actual impacts. The monitoring parameters and details will be described in the MAP. In addition, DOE requires that the project proponents develop an adaptive environmental management plan in consultation with the USACE and MDEQ that establishes thresholds for implementing corrective measures in the event this monitoring detects adverse impacts. This plan would require the participants to mitigate adverse impacts to Okatibbee Lake and surrounding environments.

Ground Water

The power plant would use up to 1 million gallons per day (mgd) of saline ground water from the Massive Sand aquifer. No adverse impacts to other users of the Massive Sand or other aquifers are anticipated from the drawdown caused by this use, because predicted drawdowns at a distance of 0.5 mile from the supply well would be less than one foot for both peak short-term and average long-term use. Construction and operation of the lignite mine would require ongoing pit water control. These operations could cause drawdown in the shallow Middle Wilcox aquifer and could adversely impact some local ground water wells depending on site-specific drawdown experienced and the specific circumstances of a given well (e.g., well depth, pump setting, etc.). It is possible that the amount of drawdown at a given well could cause diminution of supply. If an existing supply becomes unusable, alternative supplies will be provided by the North American Coal

Company, the mine operator, as required by the surface mining regulations. No adverse effects on the Lower Wilcox aquifer are expected.

Post-mining ground water quality in the reclaimed areas cannot be predicted with certainty. Based on experience at similar mines, ground water would likely have higher TDS than before mining. Therefore, development of future shallow freshwater wells in mine spoil deposits might not be feasible. However, sufficient fresh water would be available from the Lower Wilcox aquifer and public water systems during and after mining.

Terrestrial Ecology

As many as 1,085 acres of terrestrial ecological resources would be altered on the power plant site by construction of the plant and some mine-related facilities. Of this, approximately 419 acres are currently in agricultural production, mostly in pine plantations, pasture, and hay fields. Most wildlife located within the construction area would relocate to suitable onsite or adjacent habitats; small, less mobile or burrowing animals might be lost. No federally listed plants or animals were observed on the site, nor are any known to occur there, although records exist for a few listed species in the surrounding region. Two state listed species, the sharp-shinned hawk and the barred owl, were observed on the sites of the power plant, mine or both, but adverse effects are not expected due to these birds' mobility and the abundance of suitable habitat in the area. Construction and operation of the facilities on the power plant site are not expected to adversely affect either listed or migratory species.

Mine site preparation and construction activities will result in sequential vegetation removal from most of the construction areas. Approximately 1,455 acres will be affected

during the initial construction phase. Thereafter, existing terrestrial habitat will be cleared and reclaimed at an average rate of 275 acres per year. After mining, mine pits will be reclaimed and revegetated. As with the power plant site, mobile wildlife would likely relocate to adjacent, non-impacted, or restored portions of the mine study area or to suitable offsite habitats. After reclamation, various wildlife species could return to reclaimed lands relatively quickly. Individuals of less mobile or burrowing species could be lost. No federally listed plants were observed in the mine study area, although Price's potato bean may occur in the region. It is unlikely that regional populations of listed or migratory species will be adversely affected by mining.

The primary impact to terrestrial resources from linear facility construction or upgrades will result from vegetation clearing; smaller temporary impacts will occur due to pipeline trenching. Construction of the linear facilities is not expected to adversely affect any endangered or threatened plant or wildlife populations, including migratory birds.

With site clearing activities, there is the potential for introduction of invasive species. DOE requires as a condition of its decision that monitoring be conducted to determine whether invasive, exotic, or nuisance species occurrences are increasing as a result of project activities. If such occurrences are increasing as a result of the project, control and management steps will be required as specified in a Mitigation Action Plan (see "**Mitigation**").

Aquatic Ecology

The power plant is expected to have direct impact on only one surface water body. The diversion of effluent to the power plant currently being discharged from two publicly owned treatment works (POTWs) in Meridian to Sowashee Creek would reduce flows in

the creek. But it would also remove a source of pollutants to the creek. Biological communities downstream of POTWs are commonly suppressed or altered due to water quality changes. A reduction of effluent discharge may mitigate the impacts of these changes on the aquatic communities.

The lignite mine will displace aquatic habitat during active mining until habitat reclamation is completed. Diversion canals will temporarily replace the displaced aquatic habitat and provide habitat similar to existing streams and support similar biological communities.

DOE requires, as a condition of its decision, that fish and macroinvertebrate sampling, as specified in the MAP, is conducted using appropriate EPA- or Mississippi Department of Environmental Quality (MDEQ)-approved bioassessment protocols to determine whether adverse effects on the aquatic ecosystem are resulting from the project. If significant adverse effects are detected, additional mitigation will be implemented to minimize these effects, as specified in the MAP (see "**Mitigation**").

Floodplain Statement of Findings

In accordance with 10 CFR Part 1022 (DOE regulations on Compliance with Floodplain and Wetland Environmental Review Requirements), DOE considered the potential impacts of the proposed project and its connected actions on floodplains. The portion of the IGCC site that will be used for permanent facilities is wholly located above the base and critical action floodplain. Construction and operation of the plant are expected to have no direct or indirect effect on floodplains. For the construction of linear facilities associated with the power plant, direct impacts to floodplains will result from clearing vegetation, particularly shrubs and trees, from the floodplain areas and stream banks.

Also, depending upon final designs, electrical transmission tower supports could be constructed within the base floodplains and construction of the reclaimed effluent, natural gas, and CO_2 pipelines may cause temporary direct impacts to the streams that are crossed. DOE has found no practicable alternative to locating these linear facilities in floodplain areas. It requires, as a condition of its decision, that floodplain impacts be minimized through construction methods and timing to the extent practicable.

In addition to the potential floodplain impacts of the linear facilities, the connected action of developing the lignite mine will divert the flow in the Chickasawhay Creek during the initial years of mining within Mine Block A, which will disconnect the existing floodplain from the flow channel. Total storm-event runoff volumes could increase by up to 637 acre-feet (ac-ft). Okatibbee Lake, a multipurpose reservoir operated by the USACE and located approximately 5 miles downstream, has a summer flood storage capacity of 42,590 ac-ft and a winter flood storage capacity of 59,490 ac-ft. The projected increase of 637 ac-ft would be less than 1.2 percent of the winter flood storage capacity; also, peak flow rates are projected to decrease, minimizing the effect of the potential volume increase. Between 2038 and 2055—well after DOE's involvement—the mine developer may construct levees that could further affect floodplains. Conditions for avoidance, minimization, and mitigation during the period after DOE's involvement would be established by the USACE and MDEQ. During the preparation of the Final EIS and as a result of pre-application consultations with the USACE, the North American Coal Company responded to DOE and USACE comments by revising the mine development plan. Four separate mine plans were analyzed and the alternative finally selected should minimize potential wetland and floodplain impacts compared to the other practicable mine plans. However, this avoidance and minimization would result in

approximately 10.0 million tons of lignite remaining in the ground. Also, long-term operational costs would increase as a result of having to mine lignite from higher ratio (overburden to lignite) reserves with less favorable recovery economics. DOE has found no practicable alternative to mine development that would further avoid or minimize impacts to floodplains.

Wetlands

There could be impacts to as many as 2,971 acres of wetlands if the USACE authorizes the activities that would affect wetlands: 104 acres for power plant facilities on the power plant site; 25 acres for mine facilities on the power plant site; 2,375 acres in proposed mining blocks; and 467 acres within the linear facility corridors. The linear facility impacts would most likely be temporary, as they would result from construction or other short-term conversions of habitat. The remaining impacts may be permanent.

Approximately 129 acres of wetlands and streams could be lost or altered by construction activities associated with the power plant and mining facilities located on the power plant site. All of these impacts could be permanent. If authorized by the USACE, impacts will require mitigation in accordance with the Clean Water Act (CWA) under Section 404 permit requirements such that existing functional values of impacted wetlands are replaced.

Adverse impacts to as many as 2,375 acres of wetlands that lie within the anticipated life-of-mine area are expected over the 40-year life-of-mine. Any wetland impacts will require CWA Section 404 permit authorization, which could require onsite mitigation (both on reclaimed mined lands and in adjoining upland areas not disturbed by mining), offsite mitigation, or a combination of both. Based on mitigation at other mine sites in the

region, wetland functions would, after reclamation, be expected to return over time, as natural revegetation (or planting) and succession occur and wetland hydrology is restored. Long term monitoring of this process is required by both the USACE and MDEQ.

Within the linear facilities corridors, wetlands will be impacted primarily by conversion (partial clearing) of forested and some shrub-dominated wetlands for construction of linear facilities. As many as 400 acres of wetlands and 67 acres of other waters (streams, ditches, and ponds) could potentially be impacted by linear facilities construction. Most impacts will be conversion of forested and possibly shrub-dominated wetlands to shrub- and herbaceous-dominated wetland systems and all impacts would most likely be temporary. DOE has found no practicable alternative to these impacts on wetlands and it requires as a condition of its decision that any wetland impacts be avoided until the USACE finalizes its permit application evaluation process in accordance with Section 404 of the CWA. If a permit is authorized by the USACE, mitigation plans must be consistent with 33 CFR Part 332, Compensatory Mitigation for Losses of Aquatic Resources. The USACE will determine the specifics of the mitigation requirements during the Department of the Army permit application evaluation process in accordance with 33 CFR 325.

Socioeconomics and Environmental Justice

Project development is expected to result in positive direct and indirect effects through *ad valorem* taxes, sales tax proceeds from employee spending, and sales tax proceeds for purchases of equipment and services. Beyond the estimated combined construction payroll for the plant and mine of $145 million, there is an estimated additional indirect

benefit of $82 million and 186 additional jobs due to construction activities. The corresponding numbers for the operation of the plant and mine are an estimated $25 million combined annual payroll, an indirect annual benefit of about $11.4 million, and approximately 97 additional jobs. Project development may impact housing availability during construction, but sufficient housing is likely to be available.

The power plant and mine are located in census tracts that have a higher percentage of minorities and a higher percentage of population below the poverty level than other census tracts within a 7-mile radius around the plant and in the state as a whole. Therefore, DOE has concluded that an environmental justice population exists, and has examined the potential for "disproportionately high and adverse" health or environmental effects consistent with Executive Order 12898. The potential effects analyzed included health impacts from air emissions and accidental releases, displacement of landowners due to the development of the mine, effects on ground water wells, transportation impacts, housing availability, aesthetics, and noise levels in sensitive areas. Based on an analysis of these potential effects, DOE has determined that construction and operation of the facilities are not likely to result in disproportionately high and adverse impacts and burdens on an environmental justice community.

Transportation

The area roadways connecting to the existing population centers are adequate to accommodate the anticipated traffic during construction and operation. Local roads in proximity to the power plant will experience impact in the form of degraded level of service during both construction and operation. Heavy haul routes in proximity to the plant will require evaluation for weight and other limitations. The initial coal hauling

route from the Red Hills Mine to the plant site may experience as many as 80 trucks per day spread over a 16-hour day for a period of approximately six months. There will be an increase in traffic on area roadways resulting in a potential increase in accidents and injuries. The increase in truck traffic during the operations involving transport of lignite from the Red Hills Mine would be especially severe. DOE requires, as a condition of its decision, mitigation to minimize these impacts as described in the MAP.

Cultural and Historic Resources

Construction of the proposed power plant could impact one onsite historic resource (a house dating from approximately 1900). Mining could impact cultural resources which have yet to be evaluated in terms of value. Mining of future mine blocks and construction of linear facilities would likely impact several sites that have been assessed as potentially eligible for listing. Cultural resources will be avoided to the extent practicable when siting facilities. Evaluation and appropriate resource recovery will be guided by the terms of a project-specific programmatic agreement, which has been developed to satisfy Section 106 of the National Historic Preservation Act. The agreement has been signed by DOE, the USACE, the Mississippi Department of Archives and History, MDEQ, the Mississippi Band of Choctaw Indians, the Choctaw Nation of Oklahoma, Mississippi Power Company, North American Coal Company, and Southern Company Services. The programmatic agreement is a condition of DOE's decision to provide financial assistance.

Noise

Power plant construction noise would be temporary but noticeable at several nearby residences. With one exception, the highest levels experienced by residents would be no louder than maximum levels from passing vehicular traffic. Steam blows that will be

necessary over several days near the end of plant construction could potentially reach levels of annoyance to persons outdoors at the closest residences. DOE requires as a condition of its decision that Mississippi Power Company notify affected residents prior to the steam blow operation.

Noise associated with power plant operation is expected to result in an impact of 57 A-weighted decibels (dBA) at one adjacent residence, exceeding the U.S. Environmental Protection Agency residential guideline of 55 dBA but less than the Department of Housing and Urban Development residential guideline of 65 dBA. Mississippi Power is pursuing acquisition of most of the residential properties near the plant site, including the property where the highest noise impacts have been predicted. Mining would also result in localized noise impacts, primarily in the area surrounding the active mine block. An appropriate level of sound control will be designed into facility equipment to limit operational noise levels. In addition, DOE requires as a condition of its decision that noise from the loudest pieces of equipment be reasonably controlled to mitigate impacts as specified in the MAP.

Human Health and Safety

Construction of all of the facilities poses hazards typical of any large industrial construction project. Health and safety risks will accompany the construction efforts and could affect local residents as well as construction workers. Some injuries to construction workers are likely, as indicated by industry statistics. Operations of the project facilities entail risks as well, given the nature of the facilities and based on industry statistics.

The IGCC power plant would emit a maximum of 18.5 tpy of hazardous air pollutants (HAPs). Modeling studies found that these HAPs should not result in or contribute

significantly to inhalation health risks. The total cancer risk was predicted to be less than one in a million (the level below which exposures are generally considered to be acceptable). The noncancer risks are estimated to be below levels considered to have adverse health effects. Similarly, health risks from mercury emitted from the IGCC stacks are expected to be below levels of concern. DOE requires as a condition of its decision that the project proponents characterize IGCC stack emissions of HAPs as specified in the MAP.

The emissions of criteria pollutants could affect the overall mortality and morbidity of the surrounding population. The possible effects were estimated at less than one additional death per year and the lost days of life per person were predicted to be much less than one. The annual increase in hospital admissions, incidence of adult bronchitis, asthma hospital admissions, and asthma emergency room visits were all predicted to be less than one per year. The average annual number of asthma attacks among asthmatics, work loss days, and restricted activity days for the entire population were conservatively predicted to increase by 26, 56, and 298 occurrences, respectively.

Additional health and safety risks could result from the handling, storage, and transport of hazardous materials, including ammonia and CO_2, due to an accidental release or intentional act of sabotage or terrorism. A catastrophic rupture of an ammonia storage tank or tanker truck could potentially cause severe health effects up to 1.7 and 1.2 miles from the accident, respectively. A complete rupture of the CO_2 pipeline would potentially result in adverse health effects to exposed persons within 0.7 mile of the accident. Population levels along the pipeline corridor are low, and given the limited extent of the affected area, it is unlikely that an accident would result in injuries. All of these results were based on the most severe reasonably foreseeable scenarios.

Potential Environmental Impacts of the No-Action Alternative

Under the no-action alternative, DOE assumed there would be no development at the site, since there are no other reasonably foreseeable plans for development. Therefore, the impacts under the no-action alternative (i.e., no development) were evaluated in the EIS and compared to the proposed action. There would be no new sources of air emissions affecting air quality; there would be no changes in existing hydrologic conditions and no alterations of stream flow, path, and water quality; existing impaired habitats and low diversity aquatic communities would remain; and there would be no alteration or loss of existing floodplains, floodplain storage, or flood conveyance capacity. There would be no change in existing socioeconomic conditions, no potential for economic stimulus from proposed project, and no change in existing conditions relative to community services; no change in existing conditions relative to environmental justice populations and no potential for adverse impacts or economic benefits from the proposed project. There would be no change in existing vehicular traffic and level of service conditions would remain the same; potentially affected cultural resources would remain in place and not be recovered; no new sources of noise would be built and operated; and there would be no added health and safety risks. Increased emissions of greenhouse gases would likely still occur, but these increases would depend on the technology that would be used to generate the power that would have been provided by the project.

Environmentally Preferred Alternative

The no-action alternative is environmentally preferable because it would result in no change to the existing environmental conditions.

Comments Received on the Final EIS

DOE received comments on the Final EIS from two federal agencies: EPA's Region 4 (EPA) and the Department of the Interior (DOI). DOE did not receive any other comments on the Final EIS. EPA's comments supported selection of the IGCC technology but noted there are environmental concerns inherent to any power plant and mining operations. The specific concerns in EPA's comments involved air quality impacts, climate change issues, impacts to waters of the United States, bioaccumulation of mercury, effluent discharges, impacts to drinking water supplies, effects on housing availability and cost for environmental justice populations, and mitigation of the effects of increased traffic. DOI's comments focused on impacts to aquatic resources.

EPA's comments on air quality impacts were related to the new 1-hour National Ambient Air Quality Standards (NAAQSs) for NO_2 (100 parts per billion, or ppb) and SO_2 (75 ppb). Due to the timing of the issuance of these new standards and of the Final EIS, it was not possible to address these new standards in the EIS. The conclusion in the Final EIS that NAAQSs would not be exceeded was based on modeling done for MDEQ's air permitting process, a process that was completed before the new NO_2 standard became effective on April 12, 2010.[1] The SO_2 standard will not become effective until August 23, 2010. In response to EPA's comment that information on the project's impacts as to these new standards should be provided, DOE conducted a conservative screening-level analysis and found that the project would have a maximum impact of 41 ppb (1-hour average) of NO_2 and 36 ppb (1-hour average) of SO_2. These new standards for NO_2 and SO_2 are likely to result in revisions to Mississippi's State Implementation Plan under the

[1] The NO_2 standard is currently under judicial review. *See American Petroleum Inst. v. EPA*, No. 10-1079 (D.C. Cir. Apr. 13, 2010).

Clean Air Act. The state would assess air quality levels within the state and identify any areas that fail to comply with these standards. Mississippi would need to design and implement control strategies for these "nonattainment areas" that would bring them into compliance with the new NAAQSs for NO_2 and SO_2. This statutory process for state implementation of new NAAQSs would include any monitoring or more refined modeling that MDEQ determines is needed to ensure compliance with these standards.

As to climate change issues, EPA questioned the use of 0.3 to 2.1 metric tons of carbon per acre per year for estimating lost sequestration potential and suggested using a value of 1.1 to 7.7 tons of carbon dioxide. In fact, 2.1 metric tons of carbon per year is equivalent to 7.7 tons of carbon dioxide per year.[2] EPA also requested a reference for the 1 metric ton sequestration potential difference between forest and grassland. That figure was obtained from "Greenhouse Gas Mitigation Potential in U.S. Forestry and Agriculture" (EPA 430-R-05-006).

EPA expressed concern about impacts to waters of the United States, in particular impacts to perennial streams, adjacent wetlands, and their buffers that have the potential to negatively impact Okatibbee Lake. DOE agrees that, to the extent practicable, "avoidance and minimization of impacts should be fully realized" in the permitting process under Section 404 of the Clean Water Act and the regulations that implement it (40 CFR Part 230). However, complete avoidance, as suggested in EPA's comment, of all such impacts may not be practicable. Monitoring of the mine's downstream water quality and volume effects on the lake, as recommended by EPA, as well as development of an adaptive management plan in consultation with the USACE, are conditions of

[2] One converts tons of carbon to tons of carbon dioxide using the ratio of the molecular weights of the two substances (44/12).

DOE's decision and will be included in the MAP. EPA also expressed its views on Section 404 permit conditions (e.g. conditioning subsequent permits on the success of mitigation, appropriate use of site protection instruments, use of mitigation banks or establishment of a single user bank, and compliance with the USACE and EPA Mitigation Rule). However, these concerns are more appropriately addressed to the USACE, the agency responsible for implementing Section 404 of the Clean Water Act, rather than to DOE.

With regard to bioaccumulation of mercury, EPA appreciated DOE's responses to its comments on the Draft EIS and recommended that DOE coordinate with MDEQ on updated fish tissue sampling data. DOE concluded in the Final EIS that the incremental contribution to health hazards associated with mercury uptake from the project was small compared to ambient conditions. As requested by EPA, DOE consulted with MDEQ and has determined that, although more recent laboratory data have been collected by MDEQ, no additional analysis is necessary to support DOE's conclusion.

EPA also stated that impacts of the project should be monitored as the project progresses, specifically noting that effluent discharges will be regulated under the National Pollutant Discharge Elimination System and the MDEQ Surface Mine Control and Reclamation Act permit. DOE requires as a condition of its decision that the project comply with all permit requirements, including monitoring requirements. Also, with respect to monitoring, EPA recommended that monitoring of impacts to drinking water sources be conducted and that DOE's ROD include measures to ensure the quality of drinking water supplies. DOE requires the participants to conduct such monitoring and mitigation as a condition of its decision. The required measures will be described in the MAP.

With regard to environmental justice, EPA requested that the potential impacts on housing and transportation be acknowledged and that potential mitigation measures (i.e. housing or rental assistance) be identified in the ROD. DOE's analysis of potential impacts to environmental justice populations concluded that there would not be disproportionately high and adverse impacts. However, DOE acknowledges that there is always the possibility of unanticipated or unforeseeable impacts. Therefore, DOE requires as a condition of its decision that housing availability be monitored and information on its availability, cost, utility costs, and potential sources of assistance be provided as described in Mississippi Power's Kemper County Community Plan. EPA commended this Community Plan and encouraged Mississippi Power to continue to provide opportunities for community engagement and to pursue a strategy of employment and training opportunities for the local population. DOE agrees and also encourages Mississippi Power to continue and expand its community outreach activities.

Regarding transportation impacts, EPA recommended that DOE consult with the Mississippi Department of Transportation and the Federal Highway Administration on the development of mitigation measures. DOE has contacted both agencies and has identified mitigation measures that it will include in the Mitigation Action Plan.

DOI expressed its views on the impacts to aquatic resources from the power plant and mine, noting that there are two separate Section 404 permit applications before the USACE. DOI stated that, for the power plant, impacts to wetlands and streams have been minimized and adequate compensatory mitigation has been proposed. DOI also restated its determination in a letter dated January 14, 2010, to the USACE that the lignite mine would have substantial and unacceptable impacts on aquatic resources of national importance and recommended that all lost wetland functions and values be mitigated at a

suitable offsite area within the watershed. DOE recognizes that DOI considers the current mitigation plan proposed by the North American Coal Company for the mine to be inadequate. DOE expects that additional avoidance and minimization, as well as appropriate mitigation consistent with the applicable Mitigation Rule, will be developed through USACE's Section 404 permit application evaluation process, in consultation with the U.S. Fish and Wildlife Service, EPA and MDEQ. Compliance with the requirements of the Section 404 permit (if authorized), as well as all other applicable permits, is a condition of DOE's decision.

Issued in Washington, DC, on this 12th day of August 2010.

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Office of Fossil Energy