Entergy

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G3NO-2008-00001

October 6, 2008

U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001
Attention: Document Control Desk

DOCKET NO.: 52-024

SUBJECT: Responses to NRC Requests for Additional Information on Environmental Report (GG3 COLA)

REFERENCES:

1. Entergy Operations, Inc. letter to NRC, *Application for Combined License for Grand Gulf Unit 3*, dated February 27, 2008 (CNRO-2008-00008) (ADAMS Accession No. ML080640433)
2. NRC Letter to Entergy Nuclear, *Request for Additional Information Regarding the Environmental Review of the Combined License Application for Grand Gulf Nuclear Station, Unit 3*, dated September 8, 2008 (ADAMS Accession No. ML082321325)

Dear Sir or Madam:

In Reference 1, Entergy Operations, Inc. (Entergy) submitted an application for a combined license (COL) for Grand Gulf Nuclear Station (GGNS), Unit 3.

On September 8, 2008, in Reference 2, the NRC requested additional information on seventeen items to support the environmental review of the Grand Gulf Unit 3 combined license application (COLA). The responses to the requests for additional information (RAI) are provided as Attachments 1 through 17 to this letter:

- RAI Item #1, Radiological Health
- RAI Item #2, Cost Benefit
- RAI Item #3, Aquatic Ecology
- RAI Items #4 - #10, Terrestrial Ecology
- RAI Items #11 - #17, Transmission Corridors

Enclosure 1 is a CD-ROM containing Geographic Information System (GIS) files requested in RAI Items #7 and #9. Attachment 18 provides a list of files contained on the enclosed CD-ROM. The file format and names on the CD-ROM do not fully comply with the requirements for electronic submission in NRC Guidance Document, *Guidance for Electronic*

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to the NRC, dated November 20, 2007 in that the files are not "*.pdf" formatted. The NRC Staff requested the files be submitted in their native formats required by the software in which they were utilized to support the ER development. The file names are those required for proper software operation.

This letter contains new commitments as identified in Attachment 19.

Should you have any questions, please contact me or Mr. Tom Williamson of my staff. Mr. Williamson may be reached as follows:

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E-Mail Address: twilli2@entergy.com

I declare under penalty of perjury that the foregoing is true and correct.

Executed on October 6, 2008.

Sincerely,

WKH/ghd

Attachments:
1. Response to ER RAI Item #1
2. Response to ER RAI Item #2
3. Response to ER RAI Item #3
4. Response to ER RAI Item #4
5. Response to ER RAI Item #5
6. Response to ER RAI Item #6
7. Response to ER RAI Item #7
8. Response to ER RAI Item #8
9. Response to ER RAI Item #9
10. Response to ER RAI Item #10
11. Response to ER RAI Item #11
12. Response to ER RAI Item #12
13. Response to ER RAI Item #13
14. Response to ER RAI Item #14
15. Response to ER RAI Item #15
16. Response to ER RAI Item #16
17. Response to ER RAI Item #17
18. List of Files Contained on the Enclosure 1 CD-ROM
19. Regulatory Commitments

Enclosure: 1. CD-ROM Containing Requested GIS Files

cc: (email; w/o Enclosure 1 unless otherwise specified):

Mr. T. A. Burke (ECH)
Mr. S. P. Frantz (Morgan, Lewis & Bockius) w/Enclosure 1
Mr. B. R. Johnson (GE-Hitachi)
Ms. M. Kray (NuStart)
Mr. P. D. Hinnenkamp (ECH)

NRC Project Manager – GGNS COLA
NRC Director – Division of Construction Projects (Region II)
NRC Regional Administrator - Region IV
NRC Resident Inspectors' Office - GGNS

ATTACHMENT 1

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RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #1

RAI QUESTION NO. 1

NRC RAI Item #1

Item	ESRP/ER Section	RAI	Supporting information
RADIOLOGICAL HEALTH			
1	ER Section 4.5	What is the revised estimated dose to construction workers including that from the Independent Spent Fuel Storage Installation (ISFSI) and from Nitrogen-16 source from main turbine building?	See related Safety RAI.

Entergy Response

The Grand Gulf Unit 3 estimated construction worker dose has been determined based on the most current radiological monitoring data available for Grand Gulf Unit 1, including dose contribution from main Turbine Building direct radiation and increased airborne release quantities, and using inputs from the dose analysis for the Unit 1 Independent Spent Fuel Storage Installation (ISFSI). The estimated maximum annual individual construction worker dose has been determined to be 81.1 mrem/yr. Based on an exposure period of 2080 hours per year, the average one-hour dose occurring as a result of all sources of radiation from GGNS Unit 1 is 3.9E-02 mrem. The predicted collective dose based on an estimated workforce of 3150 workers is 255 rem.

Proposed COLA Revision

Environmental Report Section 4.5 will be revised in a future COLA submittal to address the revision to the estimated construction worker dose as discussed above, and will be consistent with the revision to FSAR Appendix 12CC to be made in response to the NRC's request for additional information Letter No. 03, related to SRP Section 12.03 - 12.04, for the Grand Gulf combined license application.

ATTACHMENT 2

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RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #2

RAI QUESTION NO. 2

NRC RAI Item #2

Item	ESRP/ER Section	RAI	Supporting information
		COST BENEFIT	
2	ESRP Section 10.4.1	Quantify the benefits shown in Table 10.4-201 and the costs shown in Table 10.4-203 in monetary or other appropriate terms whenever practicable and determine their significance to the region.	Use consistent terms (such as present value).

Entergy Response

In general, COLA Environmental Report (ER) Section 10.4 presents costs and benefits in monetary or other appropriate terms, to the extent practicable. As discussed in more detail below, the assignment of monetary values to certain factors can introduce unnecessary uncertainty into the NRC's NEPA review process. ER Tables 10.4-201 and 203 were reviewed in support of this RAI response. Certain information provided in ER Section 10.4 text or in other portions of the application will be incorporated into these tables. Some monetary values will be revised in these tables to present a consistent reference (i.e., in terms of 2007 dollars), thus facilitating the NRC staff's weighing of benefits and costs.

A. General Discussion of Monetizing Factors Considered in Environmental Reviews of Costs and Benefits

10 CFR § 51.45(c) states in its relevant part:

> "The analyses for environmental reports shall, to the fullest extent practicable, quantify the various factors considered. To the extent that there are important qualitative considerations or factors that cannot be quantified, those considerations or factors shall be discussed in qualitative terms."

This regulation does not require that any factors be monetized, but only that factors be "quantified" to the extent practicable. Furthermore, it would be inappropriate to attempt to monetize certain factors. For example, NRC precedent holds that placing a monetary value on the benefit of electricity is inappropriate. In *Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Atomic Power Station), ALAB-179, 7 AEC 159, 172-176 (1974), the Atomic Safety and Licensing Appeal Board vacated a decision in which a dollar value had been assigned to the benefit of electricity by multiplying the energy production by an average retail rate. The Appeal Board held:

> "We have concluded that the placing of a monetary value on the benefit of electricity is not mandated either by NEPA or by Commission regulations, and that attempting such a task serves no useful purpose. If anything, the appearance of precision

> resulting from such an exercise tends to divert scrutiny from the difficult judgmental decisions involved in performing an accurate cost-benefit analysis and, specifically, in determining whether a genuine need for the facility exists."

The Appeal Board went on to observe:

> "The value to society derived from being able to meet a real demand for electricity is not measurable in dollars. If the electricity to be produced by a proposed project is genuinely needed...then the societal benefits achieved by having that electricity available is immeasurable."

The Appeal Board concluded:

> "[A]n overall balancing of costs and benefits occurs, but it is not necessary for this purpose to attempt to place a dollar value on the benefits of the electricity to be produced. Instead, on a qualitative basis, the costs associated with the optimum alternative selected must be balanced against the benefit achieved by meeting the degree of demand anticipated. To be sure, if the facility will satisfy a real demand for electricity that cannot be met by the purchase of power from other systems, then the result of the balancing may be a foregone conclusion in that, as indicated above, the alternative of not meeting the demand is unthinkable."

Subsequent NRC decisions have repeated this admonition that placing a monetary value on the benefit of electricity is inappropriate. *Illinois Power Co.* (Clinton Power Station, Units 1 and 2), ALAB-340, 4 NRC 27, 46-47 (1976); *Niagara Mohawk Power Corp.* (Nine Mile Point Nuclear Station, Unit 2), ALAB-264, 1 NRC 347, 368 (1975).

More generally, courts have held that NEPA does not require a mathematically expressed cost-benefit analysis: *Sierra Club v. Stamm*, 507 F.2d 788, 794 (10th Cir. 1974) ("[NEPA] does not require the fixing of a dollar figure to either environmental losses or benefits."); *Trout Unlimited v. Morton*, 509 F.2d 1276, 1286 (9th Cir. 1974) (holding that NEPA does not require a "formal and mathematically expressed cost-benefit analysis" because such a calculation would be subjective and the final decision is not wholly a mathematical determination); *Sierra Club v. Morton*, 510 F.2d 813, 827 (5th Cir. 1975) ("NEPA does not demand that every federal decision be verified by reduction to mathematical absolutes for insertion into a precise formula") (quoting; *Sierra Club v. Lynn*, 502 F.2d 43, 61 (5th Cir. 1974)); *Matsumoto v. Brinegar*, 568 F.2d 1289, 1291 (9th Cir. 1978) (agreeing that a cost-benefit analysis "formalized and quantified in dollars" was not required under NEPA); *Environmental Defense Fund, Inc. v. Costle*, 439 F. Supp. 980, 993 (E.D.N.Y. 1977) ("We find no requirement in NEPA for the placement of dollar values on environmental impacts. ..."); *Environmental Defense Fund v. TVA*, 371 F. Supp. 1004, 1013 (E.D. Tenn. 1973), aff'd, 492 F.2d 466 (6th Cir. 1974) ("[NEPA does not require an agency] to compute in dollar figures every environmental loss"). See also *Daly v. Volpe*, 514 F.2d 1106, 1112 (9th Cir. 1975); *Suburban O'Hare Com. v. Dole*, 787 F.2d 186, 191 n.8 (7th Cir. 1986), *cert. denied*, 479 U.S. 847 (1986) ("A cost-benefit analysis is not required of an EIS. . . .The statement is sufficient if it gives the decisionmaker and other readers enough detail concerning all of these costs and benefits to permit reasoned evaluation and decision.") (citing *South Louisiana Environmental Council v. Sand*, 629 F.2d 1005, 1013, n.7 (5th Cir. 1980)); *Sierra Club v.*

Sigler, 695 F.2d 957, 977 (5th Cir. 1983). Consistent with this precedent, the Council on Environmental Quality (CEQ) regulations provide that the weighing of various alternatives need not be displayed in a monetary cost-benefit analysis and should not be when there are important qualitative considerations. 40 C.F.R. § 1502.23.

In summary, the assignment of monetary values to certain factors injects unnecessary controversy and risk of disputes into the NRC's NEPA review. Since NRC precedents hold that a dollar value should not be placed on the benefit of the electricity to be produced, no useful purpose would be served by trying to place monetary values on many of the environmental impacts in COLA ER Section 10.4.

B. Changes to Environmental Report, Section 10.4

Based on the above position, Entergy has not attempted to assign monetary values to most of the benefits and costs in Tables 10.4-201, 10.4-203, and 10.4-204, except in those cases in which a monetary value is clearly appropriate and readily available (such as tax payments and the costs of construction and operation of the plant). However, Entergy has quantified other benefits and costs, to the extent practicable. For example, Entergy has quantified the number of workers at the plant, the amount of electricity expected to be generated, the amount of avoided air pollutants, and land usage.

As noted in the introduction to this response, Entergy will modify Tables 10.4-201 and 10.4-203, as indicated in the attached draft markups, to include quantities provided or referenced in other parts of the ER. Dollar amounts presented for the costs and benefits in ER Section 10.4 (Rev. 0) were based on a range of dollar values from 2004 to 2007. To provide a consistent presentation of cost and benefit dollar amounts, monetary values presented in the proposed revisions to the tables are presented in 2007 dollars.

Specifically, construction and operation worker wages, as presented in ER Section 10.4 (Rev. 0) were based on Department of Labor information for 2004 (ER Section 10.4.4, Reference 203) and Nuclear Entergy Institute information for 2005 (ER Section 10.4.4, Reference 204), respectively. For this RAI response, these values were adjusted using Bureau of Labor Statistics methodology to 2007 dollars. Therefore, values for construction and operation worker average annual wage, total annual income, and estimated personal income taxes were revised. These revised values are presented in the attached draft changes to ER Section 10.4 text and Table 10.4-201. Note that the total construction worker personal income tax figure of $7.5M presented in COLA ER Section 10.4.1.1.1 (in 2004 dollars) should have been $7.1M; however, the revised value of $7.9M in the attached draft markup represents 2007 dollars, as discussed.

Proposed COLA Revision

The text of ER Sections 10.4.1.1.1, 10.4.1.1.2, 10.4.2.1.2, 10.4.2.2.1, and Tables 10.4-201, 10.4-203, and 10.4-204 will be revised as shown in the attached draft markups.

Markup of Grand Gulf COLA

The attached markup represents Entergy's good faith effort to show how the COLA will be revised in a future COLA submittal in response to the subject RAI. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different than as presented herein.

10.4 BENEFIT-COST BALANCE

The information for this section is not provided in the ESP Application Part 3 – Environmental Report. The following new information is provided.

10.4.1 BENEFITS

The benefits associated with construction and operation of the proposed Unit 3 are described in this section and outlined in Table 10.4-201. The beneficial impacts of avoided air pollutants are summarized in Table 10.4-202. The principal benefits are summarized in Table 10.4-204.

10.4.1.1 Monetary Benefits

The following sections consider the monetary benefits of constructing and operating Unit 3.

10.4.1.1.1 Tax Payments

As stated in NUREG-1817, Subsection 4.5.3.2, the state of Mississippi and the counties surrounding Unit 3 would "experience an increase in the amount of taxes collected from labor, services, construction materials, and supplies purchased for the project." Mississippi would collect franchise taxes at the rate of $2.50 per $1000 on the capital. The state also collects contractor's tax from contractors based on the total contract amount. The contractor tax is typically 3.5 percent, however for construction contracts on manufacturing facilities, the rate is 1.5 percent. If the construction cost is $4.5 billion (Subsection 10.4.2.1.1), the contractor's tax would amount to approximately $68 million (2007 dollars).

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NUREG-1817, Subsection 4.5.3.2, also states that Mississippi and Claiborne County would benefit from property taxes related to the incremental increase in value to the entire Grand Gulf site from the additional unit. Currently, Unit 1 is taxed under such a unique provision of Mississippi's tax law, it is anticipated that with the addition of a new unit, the Mississippi State Legislature will revisit this law in attempts to clarify the property tax treatment and the distribution of the revenue generated from a new nuclear unit.

Under current Mississippi tax law, nuclear generating plants in Mississippi pay taxes to the Mississippi State Tax Commission, based on the annually assessed value of the generating plant. Based upon this assessment, the generating plant is taxed 2 percent of its assessed value, or $20,000,000, whichever is greater. GGNS currently pays $20,000,000 annually to the Mississippi State Tax Commission. The Tax Commission then distributes this revenue in accordance with the tax law (Reference 201).

Assuming the property tax laws will not change, the Mississippi State Tax Commission finds the ownership of Unit 3 to be separate and apart from the ownership of Unit 1, and the owners would not be able to take advantage of economic incentives, the minimum tax liability for a new unit under the current tax structure would be $20,000,000 (2007 dollars).

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In Mississippi, personal income is taxed at 3 percent for the first $5000; 4 percent for the next $5000; and income greater than $10,000 is taxed at a rate of 5 percent (Reference 202). According to the U.S. Department of Labor, construction workers in the region can be expected to

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earn $22.96 per hour or about $48,000 annually, in 2004 dollars (Reference 203), which would be about $53,000 in 2007 dollars. During peak construction, 3150 workers will add about ~~$7.5~~$7.9 million (2007 dollars) in annual personal income taxes to the state's annual economy. Operational workers would contribute additional taxes to the state's annual economy. NUREG-1817, Table 2-13 lists 700 workers for Unit 1. However, due to the synergistic effects of co-locating two similar units on the same site, it is anticipated for Unit 3 that the approximate number of workers will be 400. The 2006 NEI study (Reference 204) lists an average permanent employee wage of about

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$69,000 (2005 dollars) per year, which would be about $73,000 in 2007 dollars. At this wage, 400 operations workers would contribute ~~$1.32~~$1.4 million (2007 dollars) in annual personal income taxes.

The large tax revenues generated from construction and operation of Unit 3 would benefit the state and local government agencies because they would support the development of infrastructure and services that support the community, and promote further economic development.

10.4.1.1.2 Local and State Economy

The in-migration of construction workers is likely to create new indirect service jobs in the area. When applying a multiplier effect, each dollar spent on goods and services by a construction worker becomes income for the recipients, who save some but re-spend the remainder. The number of times the final increase in consumption exceeds the initial dollar spent is called the "multiplier." During the period of peak construction, it is anticipated that the project will employ approximately 3150 construction workers. At an annual wage of

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~~$48,000 (Reference 203)~~$53,000 (2007 dollars), these workers would be paid ~~over $150~~$167 million (2007 dollars), which will contribute to the regional economy. When the dollar multiplier is considered, this figure would be increased further. These 3150 direct construction jobs would result in a proportionate number of indirect jobs, which would also benefit the economy.

As noted earlier, the anticipated number of operational employees for Unit 3 is 400. At the

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average reported wage of about ~~$69,000~~$73,000 (2007 dollars) for current Grand Gulf permanent employees (Reference 204), GGNS would pay another ~~$27.6~~$29.2 million (2007 dollars) annually, which would contribute to the economy of the region. These direct operations jobs would also result in a proportionate number of indirect jobs in the region.

Unit 1 jobs pay as much as 50 percent more than the average salaries for Claiborne and Warren counties. The economic activity generated by Unit 1 creates another 150 jobs in the two counties. (Reference 204) The added value from Unit 3 should be similar to the value of Unit 1.

Economic benefits related to construction and operation of Unit 3 are addressed in Sections 4.4 and 5.8, respectively.

10.4.1.2 Non-Monetary Benefits

The following sections consider the non-monetary benefits of constructing and operating Unit 3.

10.4.2.1.1 Construction

The projected internal monetary costs related to the construction of Unit 3 are provided in Section 3.1 of Part 1 (General and Administrative Information) of this COL Application.

10.4.2.1.2 Operation

Operational expenses will be incurred throughout the life of the plant and include costs for operation and maintenance, fuel, and decommissioning (Reference 211). Operational costs for power plants are frequently expressed as the levelized cost of electricity, which is the price at the busbar needed to cover operating costs and annualized capital costs. Overnight capital costs account for approximately one-third of the levelized cost, and interest costs on the overnight costs account for another 25 percent (Reference 212). Fuel costs, along with fixed and variable operation and maintenance (O&M) costs, account for the remainder.

Specifically regarding fuel costs, the University of Chicago study (Reference 212) provides reasonable estimates of this component of the overall levelized costs of electricity. This study lists fuel costs along with O&M costs under the assumption that no policies benefiting nuclear power are in effect. These costs are included in calculations of the levelized costs of electricity.

This study lists cost parameters for fuel and O&M costs as follows:

- Nuclear Fuel Cost – $4.35 per MWh
- Nuclear Fixed O&M Cost – $60 per installed kW capacity
- Nuclear Variable O&M Cost – $2.10 per MWh

The studies described above show a wide disparity in the range of operational cost estimates. The EIA study (Reference 214) shows the levelized costs of nuclear power exceed that for other fuels, but projects that nuclear operating costs will become competitive with coal and natural gas by the year 2030. The OECD study (Reference 213) lists a range of $21 to $50 per MWe hour (in 2005 dollars). The University of Chicago study (Reference 212) lists a range of $44 to $58 per MWe hour (in 2003 dollars). The MIT study (Reference 211) listed $67 per MWe hour (in 2002 dollars). Factors affecting this range include: choices for discount rate, construction duration, plant lifespan, capacity factor, cost of debt and equity, and the split between debt and equity financing, depreciation time, tax rates, and premium for uncertainty. These estimates also include decommissioning, but due to the effect of discounting a cost that occurs as much as 40 years into the future, decommissioning costs have relatively little effect on the levelized cost. Decommissioning costs are described in Section 5.9. The aforementioned studies suggest a range of $50 to $60 (2007 dollars) per MWe hour as a reasonable estimate of levelized costs.

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The previously cited studies also provide coal- and natural gas-fired generation costs for comparison with nuclear generation costs. The OECD study (Reference 213) shows nuclear costs competitive with those of natural gas and coal. The other studies show nuclear costs exceeding cost estimates for natural gas and coal. Many of the studies in which nuclear cost is considered not to be competitive with other generation sources contain scenarios for which nuclear is shown to be not only competitive but the generation source of choice. The scenarios in

10.4.2.2.1 Land Use

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Unit 3 is designed to occupy ~~234~~262 ac. of the 2100-ac. Grand Gulf site. About half of the land to be occupied by the new unit has been previously cleared during construction of Units 1 and 2. Most of the remaining land use is upland forest. Loss of this habitat is an external cost of the construction of Unit 3. A detailed description of the land use impacts is provided in Section 4.1 – Land Use Impacts. The cost in land use for a nuclear-powered generating plant is about the same as that for a natural gas-fired plant and less than that for a coal-fired plant of comparable size (ESP ER Table 9.2-1).

10.4.2.2.2 Hydrological and Water Use

Sections 4.2 and 5.2 address hydrologic alterations for construction and operation. As discussed in these sections, there are some costs associated with providing water for various needs during construction and operation. The majority of water used for Unit 3 operations would be surface water drawn from the Mississippi River. As resolved in NUREG-1817 Subsection 5.3.2, this water use represents only a small fraction of available water even at low flow conditions. There are also costs associated with groundwater consumption. The effects related to groundwater use were judged to be SMALL. (See Sections 4.2 and 5.2.) Use of groundwater by the site should not impact off-site users in terms of either water availability or water quality. (See Sections 4.2 and 5.2.)

Relatively small levels of non-radioactive and radioactive effluents are introduced into the Mississippi River (after treatment). Water quality effects of chemical effluents discharged to the Mississippi River during Unit 3 operations are discussed in Subsection 5.2.2 and are judged to be SMALL. NUREG-1817, Subsection 5.9.3.3 resolved that effects upon humans as a result of liquid radiological effluents released from Unit 3, would be SMALL. Cooling water blowdown that discharges to the Mississippi River results in a thermal plume. NUREG-1817, Subsection 5.3.3.1, resolved that effects of a thermal plume on the Mississippi River would be SMALL and localized.

10.4.2.2.3 Air Emissions

As indicated in Table 10.4-202, a new nuclear unit the size of Unit 3 provides a substantial reduction of emissions over natural gas- and coal-powered generation alternatives. Some of the benefits of reduced emissions related to use of nuclear power for electricity generation are offset by emissions related to the uranium fuel cycle (e.g. emissions from mining and processing the fuel). However, similar types of emissions are associated with mining and production of coal and, to some extent, drilling for natural gas.

Diesel generators, auxiliary boilers and equipment, and vehicles would produce air emissions that have a SMALL impact on workers and local residents (ESP ER Subsection 5.5.1.4). Cooling towers would produce drift that deposits some salt on the surrounding vicinity. However, the level is unlikely to result in any measurable impact on plants and vegetation. Cooling towers also produce steam plumes that may partially obstruct the viewscape. These impacts from cooling towers would be SMALL. (ESP ER Subsection 5.1.1)

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TABLE 10.4-201 (SHEET 1 OF 2)
MONETARY AND NON-MONETARY BENEFITS OF UNIT 3

Benefit Category	Unit 3 Project as Proposed
State Tax Payments	$20,000,000 (2007 dollars) annually (Subsection 10.4.1.1.1).
Construction workers	An influx of 3150 workers (Subsection 10.4.1.1.2) creates an incremental increase in indirect jobs, permanent or temporary within the region.
Operational workers	An influx of 400 direct jobs (Subsection 10.4.1.1.2) will result in an incremental increase in indirect jobs in the region.
Net Generating Capacity	1520 MWe (Subsection 10.4.1.2.1).
Annual Electricity Generated (operating at 90% cap.)	~12,000,000 MWh (Subsection 10.4.1.2.1).
Fuel Diversity	Increases fuel mix diversity that reduces potential energy disruptions and other adverse consequences (Subsection 10.4.1.2.2).
Emissions Reduction	Avoidance of sulfur oxides, nitrogen oxides, carbon monoxide, and particulates associated with fossil fuel-powered generating plants (Subsection 10.4.1.2.4).
Electrical Reliability	Enhances electrical reliability (Subsection 10.4.1.2.2).
Price Volatility	Dampens potential for price volatility (Subsection 10.4.1.2.2).
Air Pollution	Significant beneficial impact in terms of avoidance of air emissions (Subsection 10.4.1.2.4).
Global Warming and Climate Change	Significant beneficial impact in terms of avoidance of greenhouse gases (Subsection 10.4.1.2.5).

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TABLE 10.4-201 (SHEET 2 OF 2)
MONETARY AND NON-MONETARY BENEFITS OF UNIT 3

Benefit Category	Unit 3 Project as Proposed
Aesthetics	Nuclear plants do not produce smog that is associated with fossil-fueled plants (Subsection 10.4.1.2.4).
Socioeconomics	Increased tax revenue supports improvements to public infrastructure and social services. The increased revenue spurs future growth and development (Subsection 10.4.1.1.1). The average annual wage for construction workers is $53,000 (2007 dollars), resulting in a total influx of $167 million (2007 dollars) a year at the height of construction (3150 workers). Positive impacts on the local economy include increased tax revenues, plant expenditures, and employee spending (Subsection (10.4.1.1.2). During peak construction, 3150 workers will add about $7.9 million (2007 dollars) in annual personal income taxes to the state's annual economy (Subsection 10.4.1.1.1). The average salary for operational workers is $73,000 (2007 dollars) annually, with 400 workers adding $29.2 million (2007 dollars) to the region's economy each year (Subsection 10.4.1.1.2). The 400 operational workers would contribute $1.4 million (2007 dollars) in annual personal income taxes to the state of Mississippi (Subsection 10.4.1.1.1).
Dependence on Foreign Energy	Reduces dependence on foreign energy and vulnerability to energy disruptions (Subsection 10.4.1.3).
Foreign Trade Deficit	Reduced Foreign Trade Deficit (Subsection 10.4.1.3).
Fossil Fuel Supplies	Offsets usage of finite fossil fuel supplies (Subsection 10.4.1.2.2).

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TABLE 10.4-203 (SHEET 1 OF 2)
INTERNAL AND EXTERNAL COSTS OF UNIT 3

Cost Category	Cost
Internal Costs	
GG3-P03-RAI-002 Overnight Capital Costs	An overnight capital cost of $3250 to $4000 (2007 dollars) per KWe selected as a reasonable estimate. (Subsection 10.4.2.1.1)
GG3-P03-RAI-002 Construction Costs	$5.2 billion to $6.5 billion (2007 dollars). (Subsection 10.4.2.1.1)
Levelized Cost of Operation	Literature range of $50 to $60 (2007 dollars) per MWe hour selected as a reasonable estimate. (Subsection 10.4.2.1.2)
External Costs	
GG3-P03-RAI-002 Land and Land Use	Unit 3 would occupy approximately ~~234~~262 ac. of the approximately 2100-ac. existing GGNS site. SMALL impact. (Subsection 10.4.2.2.1) Destruction of geological resources during uranium mining and fuel cycle. SMALL impact. (Subsection 10.4.2.2.7)
Hydrological and Water Use GG3-P03-RAI-002	There are some costs associated with providing water for various needs during construction and operation. Maximum groundwater usage during construction is 115 gpm (Subsection 4.2.2.2), and maximum groundwater usage during operation is 200 gpm (Subsection 5.2.2). Cooling water is taken from the Mississippi River after treatment. The normal makeup water flow rate for operation of Unit 3 is approximately 29,200 gpm (Subsection 5.2.2). SMALL impact. (Subsection 10.4.2.2.2) Relatively small levels of hazardous and/or radioactive effluents introduced into the Mississippi River. SMALL impact. (Subsection 10.4.2.2.6) Thermal plume resulting from cooling water blowdown discharged to the Mississippi River. The effect of this thermal plume is SMALL and localized. (Subsection 10.4.2.2.2)
Terrestrial and Aquatic Species	Some cost to wildlife due to mortality during construction and operations is anticipated. However, these costs do not affect long term wildlife populations. Wildlife mortality, including aquatic biota, during operation is expected to be SMALL. (Subsection 10.4.2.2.4)

TABLE 10.4-203 (SHEET 2 OF 2)
INTERNAL AND EXTERNAL COSTS OF UNIT 3

Cost Category	Cost
Radioactive Effluents and Emissions	Radioactive waste is generated. The plant produces radioactive air emissions. Relatively small levels of radioactive effluents are introduced into the Mississippi River after treatment. SMALL impact. (Subsection 10.4.2.2.6)
External Costs (cont.)	
Hazardous and Radioactive Waste	Storage, treatment, and disposal of low-level radioactive spent nuclear fuel. SMALL impact. (Subsection 10.4.2.2.6) Commitment of geological resources for disposal of radioactive spent fuel. SMALL impact. (Subsection 10.4.2.2.6)
Air Emissions	Air emissions from diesel generators, auxiliary boilers and equipment, and vehicles that have a SMALL impact on workers and local residents. (Subsection 10.4.2.2.3) Cooling tower drift that deposits some salt on the surrounding vicinity, but the level is unlikely to result in any measurable impact on plants and vegetation. Cooling tower atmospheric plume discharge. SMALL impact. (Subsection 10.4.2.2.3)
Materials, Energy, and Uranium	Irreversible and irretrievable commitments of materials and energy, including depletion of uranium. Construction of Unit 3 is estimated to require 354,983 cubic yards of concrete, 70,997 tons of rebar, 6,282,368 linear feet of cable, and up to 245,507 linear feet of piping greater than 2.5 inches in diameter. SMALL impact. (Subsection 10.4.2.2.7)
Postulated Accident	The costs of postulated accidents would be large. However, the probability of such accidents is very small. Therefore, the overall probability-weighted costs of postulated accidents are SMALL. (Subsection 10.4.2.2.8)
Socioeconomic	Construction of Unit 3 may pose additional costs to public and social services in the area. However, these costs likely would be more than offset by increased tax revenues generated directly and indirectly by plant construction and operation. MODERATE adverse to LARGE beneficial impact. (Subsection 10.4.2.2.9)

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TABLE 10.4-204 (SHEET 1 OF 4)
SUMMARY OF PRINCIPAL BENEFITS AND COSTS FOR CONSTRUCTING AND OPERATING UNIT 3

Attribute	Benefits
Net Electrical Generation	Obtain a relatively clean and abundant form of base load electricity that is relatively cost-competitive with fossil fuels. (Subsection 10.4.1.2.2) Electrical generation: ~12,000,000 MWh. (Subsection 10.4.1.2.1)
State Tax Payments	Construction contractor's taxes estimated at approximately $68 million (2007 dollars). (Subsection 10.4.1.1.1) It is assumed that Unit 3 will pay $20,000,000 (2007 dollars) in taxes annually during operation. (Subsection 10.4.1.1.1)
Regional Productivity	An influx of 3150 construction workers will also create indirect jobs; permanent or temporary. (Subsection 10.4.1.1.2) An influx of 400 direct operational jobs also results in an increase in indirect jobs. (Subsection 10.4.1.1.2) Provides relatively clean, reliable, price competitive source of energy. Creates jobs and stimulates local economy. (Subsection 10.4.1)
Fuel Diversity	Increases fuel mix diversity that reduces potential energy disruptions and other adverse consequences. (Subsection 10.4.1.2.2)
Electrical Reliability	Enhances electrical reliability. (Subsection 10.4.1.2.2)
Price Volatility	Dampens potential for price volatility. (Subsection 10.4.1.2.2)

GG3-P03-RAI-002

TABLE 10.4-204 (SHEET 3 OF 4)
SUMMARY OF PRINCIPAL BENEFITS AND COSTS FOR CONSTRUCTING AND OPERATING UNIT 3

Attribute	Benefits
Socioeconomic	Increased tax revenues generated directly and indirectly by plant construction and operation more than offset socioeconomic costs. Increased tax revenue supports improvements to public infrastructure and social services. Increased taxes and revenue spurs future growth and development. (Subsection 10.4.1.1.1)
Attribute	**Costs**
Capital and Operating Costs	Overnight Capital Costs are estimated at $3250 to $4000 (2007 dollars) per KWe as a reasonable estimate. Construction costs have been estimated at $5.2 billion to $6.5 billion (2007 dollars). (Subsection 10.4.2.1.1) Levelized operational costs are estimated at $50 to $60 (2007 dollars) per MWh. (Subsection 10.4.2.1.2)
Aesthetics	Produces a relatively small vapor plume that can obscure the viewscape. (Subsection 10.4.2.2.3)
Fossil Fuel Supplies	Consumes finite supplies of uranium. (Subsection 10.4.2.2.7)
Land and Land use	Unit 3 would occupy approximately ~~234~~262 acres of the approximately 2100-acre existing GGNS site. (Subsection 10.4.2.2.1)
Hydrological and Water Use	Consumes some water. Produces a thermal plume and small amounts of hazardous/ radioactive waste are discharged into the Mississippi River after treatment. (Subsection 10.4.2.2.2)
Terrestrial and Aquatic Species	Some cost to wildlife due to mortality as a result of construction and operation of the plant. (Subsection 10.4.2.2.4)

GG3-P03-RAI-002

GG3-P03-RAI-009

ATTACHMENT 3

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #3

RAI QUESTION NO. 3

NRC RAI Item #3

Item	ESRP/ER Section	RAI	Supporting information
AQUATIC ECOLOGY			
3	Aquatic Ecology ER Section 2.4.2	Provide information on the areas surveyed for mussels on November 20, 2006.	What locations were surveyed visually for mollusk shells? What locations were surveyed in the river? Please provide GPS locations for surveyed areas.

Entergy Response

In a letter to the NRC dated August 27, 2008 (CNRO-2008-00027), Entergy provided a summary of the mussel survey completed in November 2006 by American Aquatics, Inc. (AAI) on the east bank of and in the Mississippi River near the existing GGNS Unit 1 barge slip, in response to NRC follow-up item (no. EA2) from the June 2008 NRC environmental site audit. That summary generally described the process used by AAI to conduct the mussel survey and provided a general description of the areas on the river shore in the river near shore, and in the barge slip that were surveyed. This response provides more specific information, as requested in this RAI, regarding areas surveyed visually on the shoreline and by the divers in the river.

The AAI staff walked the Mississippi River eastern shoreline approximately 300 feet north and south of the barge slip, visually searching for mussel shells that had washed onto the shore. As indicated in Entergy's August 2008 letter, the shoreline of the barge slip was also visually inspected.

The underwater portion of the mussel survey was comprised of six transects in the barge slip canal and Mississippi River, adjacent to the Grand Gulf site as described in the August, 2008 letter. Five parallel transects traversed the barge slip in a north-south orientation, with each transect located adjacent to and progressively to the east of the previous transect, inside the canal. Divers set chains along the canal bottom for Transects 1 - 3 and searched an area of 5 - 6 feet on either side of the chain. Having discovered zero mussels along the chained transects, divers visually divided the remaining (eastern) portion of the canal into thirds and free dove Transects 4 and 5 in an attempt to increase the search area.

Transect 6 was located parallel to the shoreline of the Mississippi River upstream of the barge canal and extended approximately 300 feet downstream. Chains were again placed in the river bottom sediments, with the search area consisting of a 10-12 foot swath.

Coordinates (NAD 83) for the start of Transects 1 - 3 and Transect 6 are approximately:

1	N 32° 01' 11.0"	W 091° 04' 03.4"
2	N 32° 01' 11.0"	W 091° 04' 03.0"
3	N 32° 01' 11.0"	W 091° 04' 02.5"
6	N 32° 01' 15.2"	W 091° 04' 02.7"

Coordinates for Transects 4 and 5 and the ending coordinates for Transects 1 - 3 and 6 are not available.

Proposed COLA Revision

None

ATTACHMENT 4

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #4

RAI QUESTION NO. 4

NRC RAI Item #4

Item	ESRP/ER Section	RAI	Supporting information
TERRESTRIAL ECOLOGY			
4	ESRP Section 2.4.1	Define the construction footprint for the proposed water pipeline and discuss how the footprint affects the results of the surveys for the five State-listed plants and wetland delineation that were performed.	ER section 2.4.1.1 states that for the purpose of surveying for the five State-listed plant species in the water pipeline corridor, the corridor was assumed to be 100 ft wide. The September 10-13, 2006 and December 10-14, 2006 reconnaissance reports state that the center line location and width of the corridor are unspecified. The April 22-27, 2007 reconnaissance report states that the corridor is assumed to be 200 ft wide for wetland delineation purposes (however, no width was specified in the wetland delineation report of June 2007). The location and spatial extent of the pipeline are thus unclear. Provide the definitive construction footprint for the proposed water pipeline in a figure and GIS file (if different from the GIS file already provided to the staff). State what percentage of the definitive construction footprint was fully surveyed for the five State-listed plants and what percentage was covered by the wetland delineation.

Entergy Response

The corridor associated with the proposed intake water pipeline at the Grand Gulf site is 100 feet wide, as depicted in COLA ER Figure 3.4-201, along its length as it runs generally parallel to the existing heavy haul road where, at the bluffs, the corridor turns to the north and the pipeline runs to the clarifiers. ER Figure 3.4-201 (Sheet 1) indicates the corridor has a total width of 100 feet (i.e., 50 feet either side of the pipeline) until it generally expands to the southwest to accommodate the area supporting the intake structure and embayment construction. The definitive pipeline construction footprint in the bottomlands has not changed since ESP submittal. GIS files for the corridor footprint were provided in an earlier Entergy submittal, as noted below.

Vegetation surveys performed in September 2006 and April 2007 (as illustrated in ER RAI 4, Figure 1, included in this attachment) revealed the general corridor of the heavy haul road paralleling the pipeline, cleared to support original construction (1970's), was disturbed by previous activities. Vegetation along the corridor was noted in the September 2006 field notes to be dominated by thickets of pepper vine (*Ampelopsis arborea*), smartweed (*Polygonum lapathifolium*), swamp privet (*Forestiera acuminata*), black willow (*Salix nigra*),

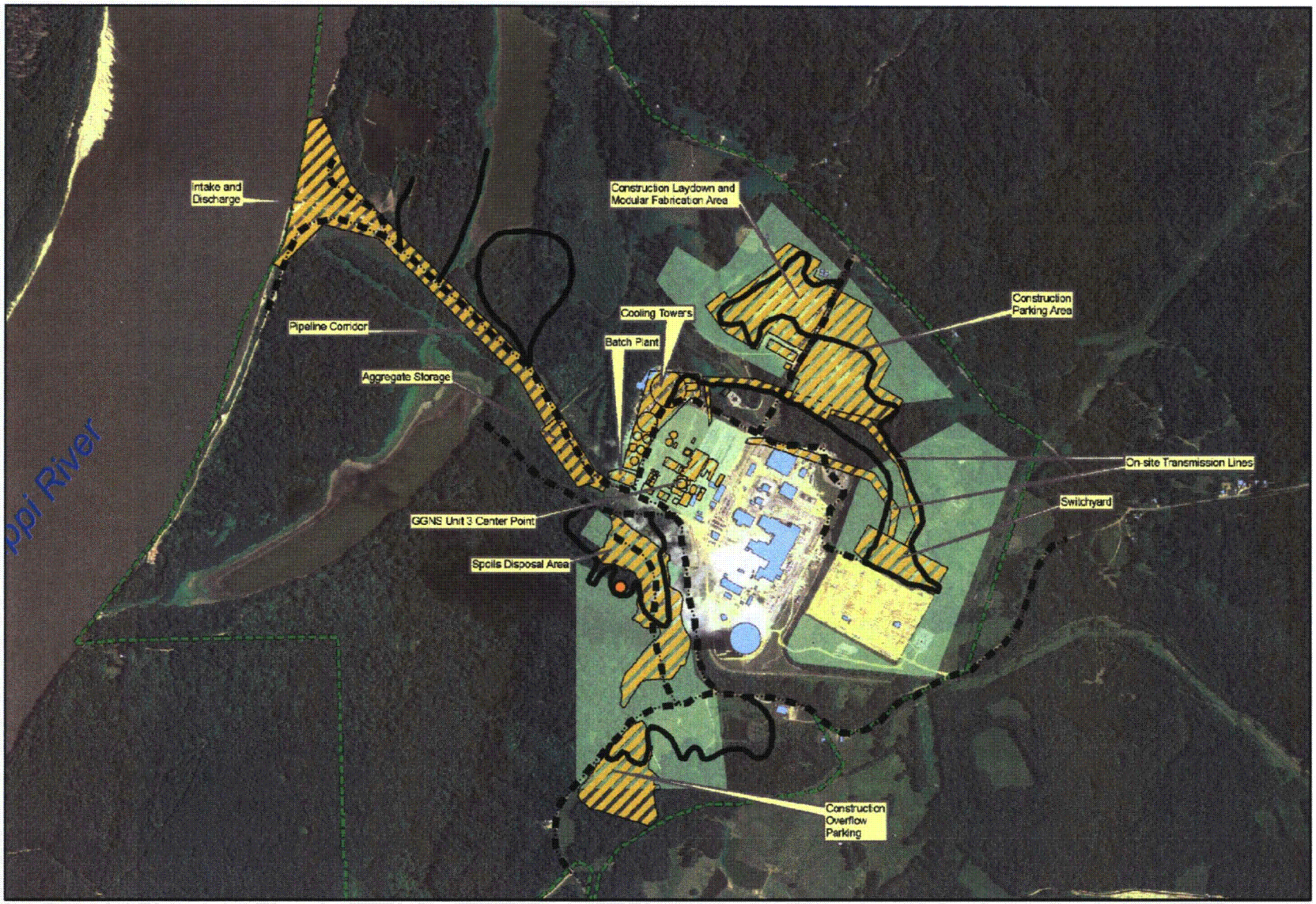
and young sycamores (*Platanus occidentalis*). The vegetation surveys revealed habitat along the edge of the pipeline corridor was suitable to support the American bittersweet (*Celastrus scandens*), glade fern (*Diplazium pycnocarpon*), and hairy waterclover (*Marsilea vestita*); however, these plants were not observed during the survey.

In April, 2007, preliminary informal wetland delineations along the pipeline corridor were performed. At that time the corridor width was not specified, so a conservative width of 200 feet was assumed. A formal wetland delineation was performed in June 2007 for the intake pipeline corridor and the general area expected to be impacted by the intake and embayment area construction. Wetland boundaries were identified along the length of the corridor using the definitive pipeline construction footprint as depicted in COLA ER Figure 3.4-201 and on ER RAI 5 Figure 2 (included in response to RAI Item #5). The estimated impacted acreage is presented in ER Table 4.3-201.

The GIS files for the definitive construction footprint for the proposed water pipeline were provided to the NRC on a DVD via Entergy letter CNRO-2008-00023, dated July 24, 2008, in response to NRC Environmental Site Audit Request LU5. Those files are superseded by the revised ER Figure 2.1-201 GIS files provided on the Enclosure 1 CD-ROM. However, the definitive construction footprint for the proposed water pipeline has not changed.

Proposed COLA Revision

None



ER RAI 4, Figure 1

Grand Gulf State Threatened and Endangered Plant Survey Locations

ATTACHMENT 5

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #5

RAI QUESTION NO. 5

NRC RAI Item #5

Item	ESRP/ER Section	RAI	Supporting information
TERRESTRIAL ECOLOGY			
5	ESRP Section 2.4.1	Provide a figure that depicts the areas surveyed for the five State-listed plants and Louisiana black bear cavity trees and related sign. Provide a figure that depicts the spatial extent of the three wetland types that would be affected by the proposed water pipeline corridor under its preliminary design.	The September 10-13, 2006 reconnaissance report states that plant surveys were conducted in the proposed water pipeline corridor, the onsite transmission line corridor connecting the new power block to the existing switchyard, and the "South Woods." The April 22-27, 2007 reconnaissance report states that the plant surveys were conducted in the fabrication and batch plant area, construction warehouse area, construction laydown area (near the old ball field), and the cooling tower area; however, these are not mentioned in ER section 2.4.1.2.1 (State-listed Plants). The spatial extent of these areas is unclear. Provide a figure depicting all the areas surveyed for plants. For any large areas (e.g., South Woods) also provide survey locations in the figure. The December 10-14 2006 reconnaissance report states that Louisiana black bear surveys were conducted on both sides of the heavy haul road and in the South Woods. The April 22-27 2007 reconnaissance report states that Louisiana black bear surveys were conducted in the area immediately adjacent to the existing switchyard and in the South Woods. The spatial extent of these areas is unclear. Provide a figure depicting all the areas surveyed for Louisiana black bear cavity trees and related sign. The Wetland and other Potentially Jurisdictional Waterbody Identification and Delineation from June 2007 discusses 17.5 acres of wetlands that would be disturbed by the proposed water pipeline corridor under its preliminary design. Provide a figure depicting the 4.2 ac of palustrine, emergent, persistent, seasonally flooded (PEM1C) wetlands; 10.1 ac of palustrine, forested, broad-leaved deciduous, seasonally flooded (PFO1C) wetlands; and 3.2 ac of palustrine, shrub-scrub, broad-leaved deciduous, seasonally flooded (PSS1C) wetlands.

Entergy Response

The following figures are provided as requested:

- ER RAI 4, Figure 1, included with the response to RAI Item #4, which indicates areas on the Grand Gulf site that were surveyed for rare plant species. ER Section 2.4.1.2.1 will be revised to further expand on the areas surveyed for rare plant species.

- ER RAI 5, Figure 1, included in this attachment, which indicates areas on the Grand Gulf site that were surveyed for Louisiana black bear. Thirty-three trees of diameter at breast height (DBH) sufficiently large to qualify as a candidate tree were identified during the Louisiana black bear habitat survey. Nine were found in the South Woods in the upland, three were found in the mixed hardwood-pine stand to the north-northwest of the new switchyard in the upland, thirteen were found south of the heavy haul road, seven were found north of the road in the bottomland and one candidate tree was located east of the South Woods. Coordinates were recorded for all candidate trees, except the three near the new switchyard.

The survey was conducted by walking transects approximately 100 feet wide through forested areas close enough to possibly be affected by on-site construction. ER RAI 5, Figure 1 identifies one tree with an exposed cavity. No scat, hair, or claw marks were detected on any of the candidate trees. One possible ground den was located in the bottomland in the area indicated on ER RAI 5, Figure 1. RAI Items #7 and #8 responses also discuss the survey results; RAI Item #7 response in Attachment 7 also includes a draft markup showing proposed COLA ER revisions related to Louisiana black bear habitat.

ER RAI 5, Figure 2, included in this attachment, which depicts the wetland classifications below along the water pipeline corridor:

- Palustrine, emergent, persistent, seasonally flooded (PEM1C) wetlands

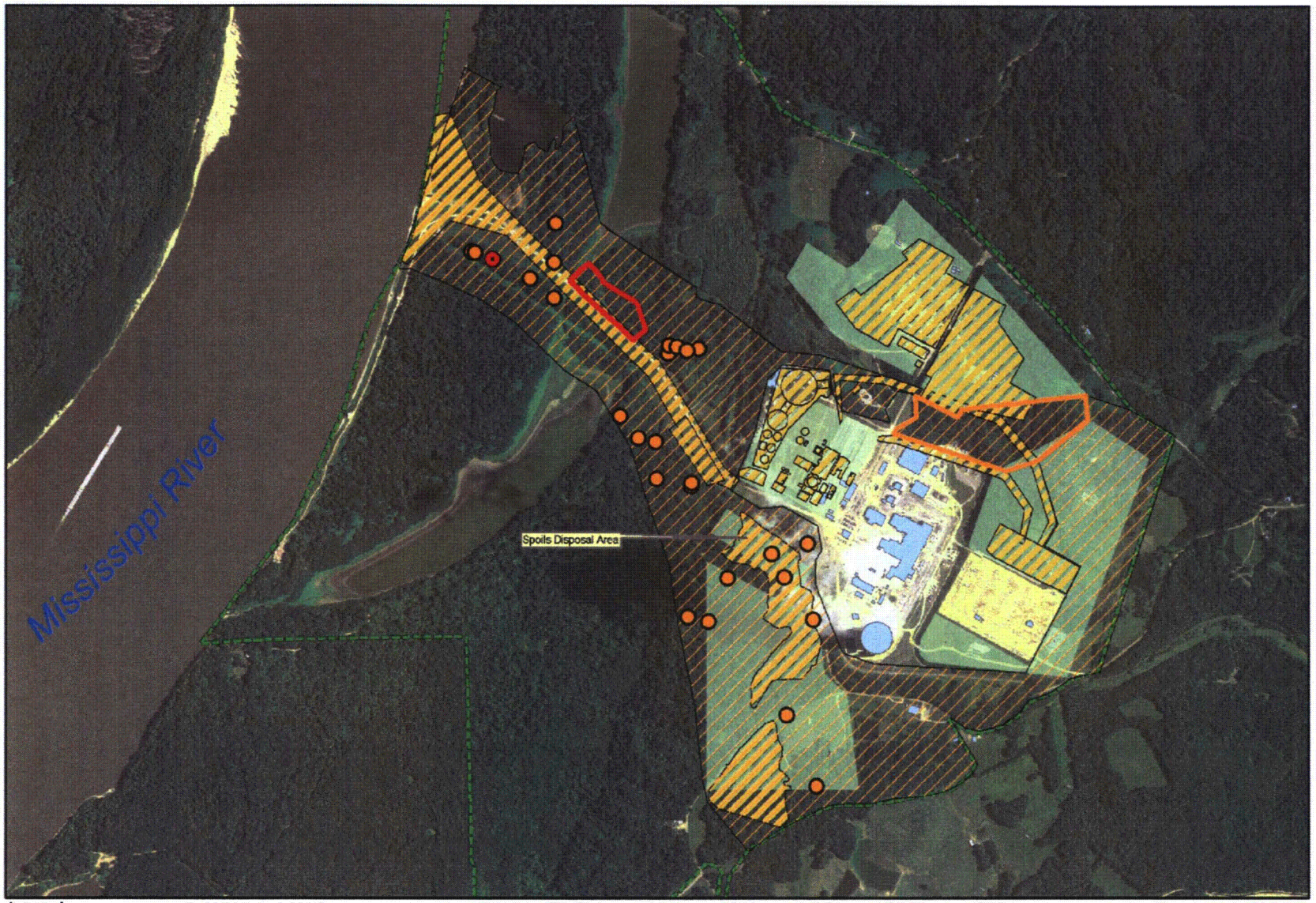
- Palustrine, forested, broad-leaved deciduous, seasonally flooded (PFO1C) wetlands

- Palustrine, shrub-scrub, broad-leaved deciduous, seasonally flooded (PSS1C) wetlands

Proposed COLA Revision

See response to RAI Item #7 for a draft markup of COLA ER Sections 2.4.1.2.2 and 4.3.1.3 showing proposed revisions related to Louisiana black bear habitat.

ER Section 2.4.1.2.1 will be revised as indicated in the draft markup included with this attachment to further expand on the areas surveyed for rare plant species.



ER RAI 5, Figure 1
Grand Gulf Louisiana Black Bear Survey

Source: National Agricultural Imagery Program, 2005.

ER RAI 5, Figure 2
Pipeline Corridor Wetlands

Markup of Grand Gulf COLA

The attached markup represents Entergy's good faith effort to show how the COLA will be revised in a future COLA submittal in response to the subject RAI. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different than as presented herein.

2.4.1.2.1 State-Listed Plants

The plants listed in NUREG-1817 as potentially occurring on-site are: (1) Allegheny monkeyflower (*Mimulus ringens*), (2) American bittersweet (*Celastrus scandens*), (3) glade fern (*Diplazium pycnocarpon*), (4) hairy waterclover (*Marsilea vestita*) and (5) jug orchid (*Platythelys querceticola*). Additionally, recent reconnaissance revealed the presence of white walnut (*Juglans cinerea*), which is on the MNHP tracking list of plants (Reference 203). The species is known to exist at only 18 sites within the state.

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~~The two~~Proposed construction areas ~~closely~~were examined on September 10-13, 2006 and April 22-27, 2007 for the presence of these State-listed plants. Poor habitat caused by previous and continuing disturbance was discovered in many areas of proposed construction. ~~are: (1) the~~The proposed water intake/discharge pipeline ROW on the north side of the heavy haul road in the floodplain, ~~and (2)~~ the proposed transmission line ROW connecting the new powerblock to the new switchyard and the South Woods area were determined to contain suitable habitat for State-listed plants and were further examined; however, none of the State-listed plants were discovered.

Water Pipeline ROW. The proposed width of the pipeline ROW paralleling the Heavy Haul Road is assumed to be 100 ft. The northern edge of the road has been significantly disturbed in the past in connection with original construction of the road and construction and maintenance of an electrical transmission line also located there. Vegetation is now dominated by thickets of invader species such as pepper vine (*Ampelopsis arborea*) and smartweed (*Polygonum lapathifolium*), typical wetland species such as swamp privet (*Forestiera acuminate*), box elder (*Acer negundo*), and black willow, and young sycamore (*Platanus occidentalis*).

Habitat suitable for the bittersweet, fern, and waterclover occurs along the north edge of the existing road ROW. None of these species were observed there. However, the floodplain area has been determined to be a jurisdictional wetland and requires a USACE permit to construct the pipeline adjacent to the maintained road/electrical transmission line ROW.

On-Site Electrical Transmission Line ROW. Although habitat suitable for some of the species of special interest occurs along the proposed ROW, especially on steep slopes and ravines, none were observed while inspecting the forested stands adjacent to Stream A.

South Woods. The lower slopes and deep ravines in this area provide habitat suitable for some of the species of special interest such as the glade fern. In addition, reconnaissance revealed two specimens of white walnut on one of the lower north-facing slopes of a major ravine. One tree was approximately 18 in. in diameter and 80 ft. tall. The other was broken in half approximately 15 ft. up the trunk, possibly by wind or lightning, and was re-sprouting. None of the other state-listed species of interest was found in any of the areas examined during this visit.

2.4.1.2.2 Louisiana Black Bear

The GGNS site offers potential habitat for the Louisiana black bear. Areas in potential upland and bottomland habitats were visually canvassed on December 13-14, 2006 and April 22-27, 2007 at approximately 100-ft. intervals on foot to identify suitable den trees of large diameter. Each large tree was closely examined for cavities and claw marks suggesting possible or potential use by

ATTACHMENT 6

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #6

RAI QUESTION NO. 6

NRC RAI Item #6

Item	ESRP/ER Section	RAI	Supporting information
TERRESTRIAL ECOLOGY			
6	ESRP Section 2.4.1	Identify areas of the construction footprint that were not surveyed for the 5 State-listed plant species and provide an explanation.	The Grand Gulf ESP EIS (NUREG-1817, Section 4.4.1.4) directs that "...upland and bottomland areas on the Grand Gulf site that would be disturbed by construction ...should undergo a botanical survey prior to initiating such activities" due to the apparently broad range of habitat affinities of the five State-listed plant species. Identify any areas of the construction footprint that were not surveyed for plants and explain why not by contrasting the habitat affinities of the species and available habitat in these areas.

Entergy Response

Rare plant surveys, which included the five State-listed plant species listed in NUREG-1817, Section 2.7.1.1, as being known to occur within 11 miles of the Grand Gulf site, were conducted September 10 - 13, 2006 and April 22 - 27, 2007.

The survey routes that were conducted for the five State-listed plant species are depicted in ER RAI 4, Figure 1 (included in response to RAI Item #4) with a solid black line (surveying on foot) and a heavy dashed line (surveying by vehicle). As noted in ER RAI 4 Figure 1, the construction footprint consists of numerous defined proposed construction areas. Survey routes were planned based on knowledge of the site, prior studies, aerial photographs, access, and the professional judgment of the survey staff. As such, survey routes targeted portions of key construction footprint areas, namely, (1) intake/discharge location, (2) water pipeline corridor, (3) South Woods area, (4) Unit 3 cooling tower and north construction laydown areas, (5) new on-site transmission ROW, and (6) the new switchyard. With the exception of areas devoid of vegetation, such as parking lots and roads, and maintained grassy lawns, habitat along the survey routes in the construction footprint was examined for characteristics that would indicate habitat suitable to accommodate any of the five State-listed species. Habitat characteristics are discussed in NUREG-1817 Subsection 2.7.1.1. The survey staff walked through areas where habitat suitable to sustain a plant of interest was identified, such as the on-site transmission corridor, portions of the South Woods, and the area adjacent to the water pipeline corridor.

Proposed COLA Revision

None

ATTACHMENT 7

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER
DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #7

RAI QUESTION NO. 7

NRC RAI Item #7

Item	ESRP/ER Section	RAI	Supporting information
TERRESTRIAL ECOLOGY			
7	ESRP Section 2.4.1	Provide figures and GIS files of occurrences of state or federal species of concern on the Grand Gulf site.	Provide figures and accompanying GIS files depicting the locations of species identified during the reconnaissance visits, i.e., 30 black bear candidate trees, the candidate tree with the cavity, the probable ground den, white walnut locations, etc.

Entergy Response

ER RAI 5, Figure 1, included in Attachment 5, identifies the locations of trees with a diameter at breast height (DBH) larger than 36 inches (a tree with a 36-inch DBH is required to be considered as a candidate tree for a Louisiana black bear den) and the possible ground den location. Habitat surveys revealed 33 trees of a size that could provide denning habitat for the Louisiana black bear. No trees exhibited signs of bear use (e.g., hair, claw marks, or scat) and only one tree with a DBH greater than 36 inches had an inner cavity. A possible ground den location was identified north of the heavy haul road in bottomland habitat.

Among the important species discussed in the ER, very few were identified as occurring at the GGNS site. Mussel surveys, plant surveys, and a habitat survey for the Louisiana black bear were conducted. The mussel survey revealed no live mussels adjacent to the proposed site of the Unit 3 intake embayment or native dead (shells) mussels on the surveyed portions of the bank adjacent to the proposed embayment and discharge outfall locations.

Two individual white walnut trees were identified in the South Woods (wooded habitat south of the heavy haul road and the Unit 3 power block location in the upland) outside of any planned construction areas. See ER RAI 4, Figure 1, included in Attachment 4 as a part of the response to RAI Item #4, for the location of the white walnut trees.

Enclosure 1 contains a CD-ROM with the GIS files requested. A list of the files is provided in Attachment 18.

Proposed COLA Revision

ER Subsection 2.4.1.2.2 (Louisiana Black Bear) will be revised to correct the number and clarify the locations of candidate trees as indicated in the draft markup included with this attachment.

ER Subsection 4.3.1.3 (Wildlife) will be revised to correct the number and clarify the locations of candidate trees as indicated in the draft markup included with this attachment.

Markup of Grand Gulf COLA

The attached markup represents Entergy's good faith effort to show how the COLA will be revised in a future COLA submittal in response to the subject RAI. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different than as presented herein.

the bear. Diameter at Breast Height (DBH) was measured and the location of each tree greater than or equal to 36-in DBH was recorded with a hand-held GPS. Each tree was identified to species or genus.

Thirty-three trees greater than or equal to 36-in DBH were tallied within the areas surveyed. ~~Ten~~Nine were found in the South Woods in the upland, three were found in the mixed hardwood-pine stand bordering the new switchyard in the upland, thirteen were found south of the heavy haul road, ~~and~~ seven were found north of the road in the bottomland, and one candidate tree was located east of the South Woods. Species included water oak, chinquapin oak (*Quercus muehlembergii*), and other oaks, pecans (*Carya spp.*), and elms (*Ulmus spp.*). These trees meet the criteria established by the USFWS as "candidate trees" important for black bear denning habitat. Only one tree, a 50-in. DBH oak, had an actual cavity. The cavity was open and exposed.

No trees were found with enclosed cavities, claw marks, or any evidence suggesting actual use as a den tree. However, a probable ground den occurred at a location approximately 400 ft. north of the heavy haul road and 3800 ft. east of the river bank. Section 4.3 addresses the implications of the presence of this probable den.

Possible foraging areas consisting of blackberry (*Rubus trivialis*) thickets were also noted. They were scattered but relatively common throughout the entire area. Areas holding shallow water in the bottomland are also possible foraging areas. They were also numerous throughout the area surveyed. Thus, the site appears to contain suitable black bear foraging and denning habitat in both uplands and bottomlands. However, with the exception of the possible ground den in the bottomland, there is no actual evidence of the current use of the site by bears.

2.4.1.2.3 Bald Eagle

The GGNS site offers potential nesting sites and over-wintering habitat for the bald eagle. The bald eagle is now delisted from the federal endangered and threatened species list in the lower 48 states (Reference 204). However, NUREG-1817 left the question as to whether bald eagles could be nesting in the GGNS site vicinity unresolved. Therefore a survey was undertaken to identify potential utilization of the site vicinity by nesting eagle pairs.

On December 11, 2006 a small, outboard-powered boat was employed to cruise at slow speed northbound and along the western or Louisiana shore of the river to inspect riverbank trees on the site with binoculars and a spotting scope upriver as far as the Grand Gulf Military Park, a distance of approximately 1.5 mi. north of the GGNS site. The observers then crossed to the Mississippi side of the river to continue the cruise at slow speed downstream back toward the point of launch at Port Claiborne, approximately 1.25 mi. south of the site.

Observation of potential nests and/or perched eagles was facilitated by deciduous leaf-fall that allowed excellent visibility of the tops of trees silhouetted along the river and of branches that might be used as perches by foraging eagles. Eagles typically construct large diameter nests near the top of sturdy deciduous and evergreen trees. Nests are usually reused and enlarged by the same pair of eagles from year to year. Thus, they are very obvious after leaf-fall as are eagles that might perch on or near them while scanning the river for fish and other food. No eagles were observed scavenging or perched in trees along the river bank.

loss of wetlands. BMPs are expected to be required by the MDEQ as a condition of the water quality certification of any wetland permits issued by the USACE. Loss of wetland function and value resulting from transmission line construction is considered to be SMALL to MODERATE depending on the ultimate final routing of the line and the resulting wetland types affected.

4.3.1.3 Wildlife

An unresolved item in NUREG-1817, Subsection 4.4.3.1, concerns the potential occupation of the site by the Louisiana black bear. This item is resolved by the completion of a black bear habitat survey; the results of which are discussed in detail in Subsection 2.4.1. The survey indicates that ~~about~~nearly one-third of the ~~31~~33 trees found on the site that meet the criteria of the U.S. Fish and Wildlife Service (USFWS) as "candidate trees" for potential black bear dens occur in the South Woods. ~~Seven~~Twenty more and a possible ground den are located north and south of the heavy haul road and the new water intake pipeline corridor in bottomland habitat. ~~One~~Three candidate ~~tree~~trees ~~occurs~~are located in the wooded area to the north-northwest of the new switchyard.

Loss of candidate trees by clearing reduces the potential carrying capacity of the site for bears. The acres of potential black bear habitat lost to temporary construction activities and permanent structures are reduced from those presented at ESP as a result of changes in proposed site layout planning. While any forested areas could be utilized, bottomlands are the most likely habitats to be occupied by the black bear. Forested upland and bottomland losses are shown in Table 4.3-201. No trees were found with enclosed cavities, claw marks, scat, or any other evidence suggesting actual use as a den tree. Accordingly, loss of these trees represents a SMALL impact on the local bear population, because there is little evidence other than the possible ground den of current use of the site by bears and no recent observations by on-site personnel or others of any bears in the project area. In NUREG-1817, Subsection 2.7.1.3, the NRC staff recommends a pre-construction monitoring program be developed in consultation with the USFWS. The appropriate consultations will be initiated and associated monitoring programs undertaken prior to beginning any construction activity in or adjacent to potential black bear habitat.

4.3.1.4 Avian Mortality

The information for this subsection is provided in the ESP Application Part 3 – Environmental Report, Subsection 4.3.1.4., and associated impacts are considered to be negligible in NUREG-1817, Subsection 4.4.1.4. No new and significant information has been identified.

4.3.1.5 Species of Special Interest

Consultation was initiated with appropriate state and federal agencies concerning the potential presence of threatened and endangered species within the proposed Unit 3 construction areas and along the proposed transmission line ROW, as summarized in Table 2.4-201. Agency response concerning the transmission line ROW is pending but not anticipated before application submittal. Based on review of the most recent threatened and endangered species listing, besides the removal of the bald eagle from the list, there is no reason to believe that there are any other changes to the threatened and endangered species listing with regards to Unit 3. Therefore, the NUREG-1817 Subsection 4.4.3.3 conclusion that the impacts of construction on

ATTACHMENT 8

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER
DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #8

RAI QUESTION NO. 8

NRC RAI Item #8

Item	ESRP/ER Section	RAI	Supporting information
TERRESTRIAL ECOLOGY			
8	ESRP Section 2.4.1	Define "potential upland and bottomland habitats" surveyed for candidate trees for the Louisiana black bear?	ER section 2.4.1.2.2 states that, "Areas in potential upland and bottomland habitats were visually canvassed on December 13-14, 2006 and April 22-27, 2007 at approximately 100-ft. intervals on foot to identify suitable den trees of large diameter." Explain the meaning of "potential upland and bottomland habitats" and how it was decided which habitat onsite was potential habitat.

Entergy Response

Undisturbed forested upland and bottomland habitat with varying age trees surrounding the construction areas (Figure 2.4-201) was the focus of the surveys for Louisiana black bear habitat; that is, these undisturbed forested areas were considered "potential habitat" possibly containing candidate trees. As indicated in the response to RAI Item #7, candidate trees are defined as those with at least a 36-inch DBH. Areas with small same-age trees were not canvassed as they appeared to have been reforested recently enough to indicate the absence of trees large enough to qualify as candidate denning trees; that is, trees with a DBH less than 36 inches.

ER RAI 5, Figure 1, included in Attachment 5 with the response to RAI Item #5, indicates the areas surveyed. Transects approximately 100 feet apart were walked through upland and bottomland habitat within and surrounding the construction footprint. Areas outside the cross-hatch on the figure, on the northern and southern end of the property were not surveyed due to the large separation distances from the construction areas.

Proposed COLA Revision

None

ATTACHMENT 9

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #9

RAI QUESTION NO. 9

NRC RAI Item #9

Item	ESRP/ER Section	RAI	Supporting information
TERRESTRIAL ECOLOGY			
9	ESRP Section 4.3.1	Clarify the construction footprint in the South Woods area of the Grand Gulf site.	The second paragraph in ER section 2.4.1.1 states that, "...hardwood stands south and west of the existing cooling towers [are] referred to collectively as the South Woods." The last paragraph in ER section 2.4.1.1 states that, "At the ESP stage, the South Woods area was within an area that may have been utilized for construction parking and laydown during Unit 3 construction. This has been changed and the South Woods is not expected to be utilized for construction or operations of Unit 3." This sentiment is similarly reiterated in the fourth paragraph of ER section 4.3.1.1, "None of the upland forest to be cleared occurs in the South Woods portion of the site..." However, ER Figure 2.1-201, while it does not identify the South Woods specifically, depicts "construction and/or laydown areas" and "proposed construction areas" located south and west of the existing cooling tower (apparently in the South Woods). Provide a statement as to whether there will or will not be construction in the South Woods. If there will be construction and the footprint is as depicted in Figure 2-1.201, note that the staff has already acquired the GIS file(s) that support that figure. However, if the construction footprint for the South Woods is not accurately depicted in Figure 2-1.201, provide a revised figure and accompanying GIS file(s).

Entergy Response

The South Woods, as defined in Environmental Report (ER) Subsection 2.4.1.1, are "hardwood stands south and west of the existing Unit 1 cooling tower." A more precise description is the upland forested area to the south of the proposed Unit 3 power block area and the heavy haul road, west of the Grand Gulf site south access road and Bald Hill Road, and east of the bluffs. ER RAI 9 Figure 1, included in this attachment, indicates the spatial extent of the South Woods. It is currently planned to dispose of excess spoils from site excavations and grading in the South Woods on the northern end of the area and to the south of Sedimentation Basin B and Stream B, as indicated in ER RAI 9, Figure 1. ER Figure 2.1-201 will be revised to provide an updated site plan that includes the spoils disposal location in the South Woods.

Enclosure 1 contains a CD-ROM with the GIS files for the draft Revision 1 to ER Figure 2.1-201. A list of these files is included in Attachment 18.

Proposed COLA Revision

ER Figure 2.1-201 will be revised as indicated in the attached draft markup to show the proposed spoils disposal area in the South Woods, and to generally improve the labeling on the figure.

ER Sections 2.2.1, 2.4.1.1, 4.1.1, 4.3.1.1 and Tables 4.3-201, 10.1-201 and 10.4-204 will be revised as indicated in the attached draft markup to better define the South Woods, and to discuss spoils disposal in the South Woods.

Legend

South Woods
Construction and/or Laydown Areas
Existing Buildings
Property Line

0 0.25 0.5
Miles

Source: National Agricultural Imagery Program, 2005.

ER RAI 9, Figure 1
South Woods and Construction/Laydown Areas

Markup of Grand Gulf COLA

The attached markup represents Entergy's good faith effort to show how the COLA will be revised in a future COLA submittal in response to the subject RAI. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different than as presented herein.

2.2 LAND

The information for this section is provided in the ESP Application Part 3 – Environmental Report, and associated impacts are not fully resolved in NUREG-1817; the following supplemental information is provided.

2.2.1 THE SITE AND VICINITY

The site and vicinity were described in Subsection 2.2.1 of NUREG-1817. However, the facility layout and construction areas specific to Unit 3 were not known at ESP. The following supplemental information is provided to describe the area affected by the proposed Unit 3 construction and operation. The site center point and construction footprint, including areas to be overlain by permanent Unit 3 structures, are illustrated in Figure 2.1-201. As illustrated in Figure 2.1-201, the proposed Unit 3 construction areas and permanent facility footprints occupy less land area than was described at ESP, and proposed disturbance falls generally within the areas designated for disturbance in ESP ER Figure 2.1-2 and in NUREG-1817 Figure 2-4.

The construction site cleared or disturbed areas for Unit 3 covers approximately ~~234~~262 acres (ac.) of land, all located within the site boundary. The coordinates for the center point of Unit 3 are provided in Section 2.1, "Station Location." The amount of site land described as construction laydown areas and building construction for Unit 3 are discussed in Section 4.3 and provided in Table 4.3-201.

2.2.2 TRANSMISSION CORRIDORS AND OFF-SITE AREAS

The off-site transmission corridors were discussed in Subsection 2.2.2 of NUREG-1817. The off-site transmission corridor routing was not known or identified in the ESP ER, and NRC staff assumed in the NUREG-1817 analysis that the existing corridor would be upgraded. The GGNS site is currently linked to load centers through the GGNS-Baxter-Wilson and GGNS-Franklin 500-kV transmission lines operated by the Entergy Mississippi Inc. (EMI) system. Unit 3 will require the construction of a new transmission line in addition to the existing GGNS system. Though the precise routing coordinates of the new line have not been finalized, the proposed general alignment was utilized for the purposes of this evaluation. This proposed alignment is described in Section 3.7.

The U.S. Federal Energy Regulatory Commission (FERC) has a mandated oversight role regarding connection of Unit 3 to the existing transmission grid. This role is implemented in FERC Order 2003 which mandates specific studies be performed to demonstrate that the location and design of interconnecting equipment is sufficient to protect overall system stability and integrity. These studies were performed by the Southwest Power Pool - Independent Coordinator of Transmission (SPP-ICT), for the Entergy Operating Companies' transmission system.

Transmission line construction in the state of Mississippi is regulated solely by the Mississippi Public Service Commission (MPSC) by way of issuance of a Certificate of Convenience and Necessity (CCN) from the MPSC before construction and right-of-way (ROW) acquisition can begin. Entergy Mississippi Inc. will own and operate any new transmission line that will connect to the Unit 3 switchyard and transmit power to customers along the grid. There is no direct

2.4 ECOLOGY

The information for this section is provided in the ESP Application Part 3 – Environmental Report Section 2.4. Associated impacts are not fully resolved in NUREG-1817. The following supplemental information is provided.

Certain details of the Unit 3 site layout and construction areas were not known at the ESP stage. The following information is added to describe the existing conditions within the proposed areas of disturbance for Unit 3. Ecological reconnaissance visits to the GGNS site occurred on March 27-29, September 10-13, November 20, December 10-14, 2006, and April 22-27, 2007. These visits were made to survey areas not slated for disturbance at ESP, however are now to be used for either temporary or permanent facilities. The results of these visits are included in appropriate subsections below.

2.4.1 TERRESTRIAL ECOLOGY

The GGNS site is described in NUREG-1817 Subsection 4.4.1.1 as consisting of 2100 ac., based on the original property boundary as described in the Units 1 and 2 Final Environmental Report (FER) from 1973 (Reference 201). The property is now approximately 2015 ac. in size as a result of the loss of approximately 85 ac. due to erosion by the Mississippi River.

2.4.1.1 Terrestrial Habitats

Subjective evaluation of wildlife habitat is based on the assumptions that (a) vegetation structure including species composition and physiognomy (the outward appearance of the stand) is sufficient to define its suitability for wildlife, (b) a positive relationship exists between vegetation diversity and wildlife species diversity, and (c) vegetation species composition and primary productivity directly influence wildlife population density.

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Sixty-four percent of the GGNS site remains forested. ~~There are hardwood stands south and west of the existing cooling towers~~The upland forest area to the south of the proposed Unit 3 power block area and the heavy haul road, west of the site south access road and Bald Hill road, and east of the bluffs is referred to collectively as the "South Woods." Biodiversity in these stands is enhanced by complex topography that consists of a series of narrow ridges with steep slopes, ravines, and bluffs. More than 20 species of trees occupy this area. Cherrybark oak (*Quercus pagoda*), water oak (*Q. nigra*), Texas oak (*Q. texana*), American elm (*Ulmus americana*), sweet gum (*Liquidambar styraciflua*), bitternut hickory (*Carya cordiformis*), and pecan (*C. illinoiensis*) are all common in the overstory with many trees 30 in. or more in diameter. The GGNS site has been selectively logged in the past as evidenced by the existence of stumps, many of which are of larger diameter than the existing trees.

Mast is plentiful in the South Woods. Mast refers to beechnuts, acorns, and other similar food-stuffs produced by upland hardwood trees. Mast is eaten by a variety of wildlife species.

Dominating the understory are black cherry (*Prunus serotina*), winged elm (*U. alata*), cane (*Arundinaria gigantean*), American beautyberry (*Callicarpa americana*), and pawpaw (*Asimina triloba*). The herb layer is sparse on ridges with loose oat-grass (*Chasmanthium laxum*) and cherokee sedge (*Carex cherokeensis*) common. The latter species is often considered a species

of special interest in other areas of the south and southeast, but is relatively common on the GGNS site.

The canopy in ravines and on lower, richer slopes is dominated by beech (*Fagus grandifolia*), tulip poplar (*Liriodendron tulipifera*), and basswood (*Tilia heterophylla*). The most interesting floristic element of the ravines, however, is the abundance of ferns in the understory. Fern colonies include christmas fern (*Polystichum acrostichoides*), mariana maiden fern (*Macrothelypteris torresiana*), southern shield fern (*Thelypteris kunthii*), maidenhair fern (*Adiantum pedantum*), bladder fern (*Cystopteris protrusa*), Japanese net-veined holly fern (*Cyrtomium falcatum*), and spider brake fern (*Pteris multifida*). All of these species are common in the South Woods.

Despite limitations caused primarily by the advanced age of its forests, habitat quality on the GGNS site remains high, especially in the South Woods. At the ESP stage, the South Woods area was within an area that may have been utilized for construction parking and laydown during Unit 3 construction. This has been changed and the South Woods is not expected to be utilized for construction ~~or operations of Unit 3~~parking and laydown. However, a portion of the South Woods is expected to be utilized as a spoils disposal site for construction of Unit 3 (Figure 2.1-201).

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On-Site Electrical Transmission Line Right-of-Way

The Unit 3 on-site transmission line right-of-way (ROW) begins at the northeast corner of the proposed new powerblock where it passes through a narrow middle-aged mixed oak (Quercus spp.), hickory (Carya spp.) and basswood and on the south side of Stream A immediately west of the existing water treatment plant (Figure 2.1-201). It then descends a steep slope dominated by kudzu (Pueraria montana) to cross the stream. At the crossing, Stream A is a typical riparian wetland vegetated by black willow (Salix nigra) and cattail (Typha latifolia).

After crossing the main access road to the site, the ROW enters the second forested area of special interest, a mature stand of relatively large cherrybark oak (Quercus pagoda), Texas or Nuttall's oak (Q. texana), bitternut hickory (Carya cordiformis), and pignut hickory (C. glabra) bordering another steep ravine. It continues eastward along a disturbed bluff dominated by honeylocust (Gleditsia triacanthos), a common colonizer of disturbed soil, and grasses before turning southward to again cross Stream A.

South of the stream, the ROW enters the third forested area of interest, a young to middle-aged mixed hardwood stand dominated by water oak and a mixed loblolly pine (Pinus taeda)-oak stand along the western edge of the new switchyard area, the terminus of the ROW. The fact that this vegetation community was not described in the FER for Units 1 and 2 (Reference 201) suggests that the mixed pine-hardwood community was then, as is now, of very limited distribution at the GGNS site.

4.1 LAND-USE IMPACTS

The information for this section is provided in the ESP Application Part 3 – Environmental Report, and associated impacts are not fully resolved in NUREG-1817; the following supplemental information is provided.

4.1.1 THE SITE AND VICINITY

The land-use impacts of Grand Gulf Nuclear Station (GGNS) Unit 3 construction on the site and vicinity were evaluated in NUREG-1817, Subsection 4.1.1. The assessment of the construction impacts on land use, specifically dredge spoils, borrow, and rail service, was unresolved. The following provides additional information to address these unresolved issues. Section 2.2 provides a description of land use at the Unit 3 site.

An estimated ~~234~~262 acres (ac.) of the 2100-ac. GGNS site would be affected by construction of a new facility. Including the intake structure laydown, an estimated ~~132~~160 ac. are to be overlain by permanent structures. Acreage not containing permanent structures amounts to 102 ac. and is expected to be reclaimed to the maximum extent possible. Table 4.3-201 describes the Unit 3 plant structures and acreages to be cleared or otherwise disturbed during the new construction. Unit 3 structures and construction laydown areas, as well as the construction disturbance areas proposed in the ESP, are illustrated in Figure 2.1-201.

On-site excavations, grading and dredging activities create construction spoils and borrows. However, it is expected that the grade elevations in the parking, laydown, and batch plant areas can be adjusted to balance the cut and fill volumes as much as possible, resulting in a net excess cut volume of approximately 1.61 million cubic yards. Excess material is anticipated to be disposed in an upland location to the south of the plant area in accordance with appropriate soil management and stormwater control practices. The disposal areas are situated such that they drain into existing site drainage features. Therefore, the land use impact is anticipated to be SMALL due to a small net excess of spoils materials and proper upland disposal.

No rail service is required for the construction of the ESBWR unit at the GGNS site, and no restoration of rail service to the site is currently planned. Consequently, no land use impacts to the site and vicinity are anticipated due to construction or restoration of rail service.

4.1.2 TRANSMISSION CORRIDORS AND OFF-SITE AREAS

The transmission corridor right-of-way (ROW) is described in detail in Section 3.7 and Subsection 2.2.2. The matter of transmission corridor upgrades was an unresolved issue at the time of the ESP. Calculated acreages of land use categories located within the transmission ROW are reported in Section 2.2. NUREG-1817 Subsection 4.1.2 states, "Land use impacts could be MODERATE if the preferred routing of any new transmission lines would convert significant tracts of previously undeveloped land not adjacent to the existing rights-of-way." The impacts of construction of transmission corridors are anticipated to be MODERATE due to the placement of the corridors through previously undisturbed land. Land use impacts are expected to be mitigated by using best management and standard industry practices, and following applicable laws and regulations pertaining to ground-disturbing activities, such as forest and wetlands protection and stormwater controls. Based on the evaluation described in Section 2.2,

4.3 ECOLOGICAL IMPACTS

The information for this section is provided in the ESP Application Part 3 – Environmental Report, Section 4.3, and associated impacts are not fully resolved in NUREG-1817; the following supplemental information is provided.

4.3.1 TERRESTRIAL ECOSYSTEMS

The NRC concluded in NUREG-1817 Subsection 4.4.1.5 that impacts on terrestrial ecosystems were not resolved, and that additional information is needed describing (1) potential utilization of the site by the Louisiana black bear, (2) the extent of wetland impacts resulting from the construction of the intake structure and associated pipeline, and (3) the location and nature of environmental impacts on terrestrial ecosystems associated with the construction of Unit 3 transmission system improvements. The following subsections provide the information needed to address this unresolved issue. In addition, new information regarding temporary and permanent facility layouts which have changed since ESP are presented and impacts evaluated.

4.3.1.1 Vegetation

The analysis of impacts to vegetation reported in NUREG-1817, Subsection 4.4.1.1 concludes that new construction at the GGNS site would disturb a total of about 395 acres (ac.) of the site: 340 ac. in uplands and 55 ac. in bottomlands. Additionally, NUREG-1817 states that about 125 ac. or 31 percent of the total disturbed acreage would be occupied by permanent structures and facilities: 100 ac. in uplands and 25 ac. in the bottomland.

Based on analysis of the proposed Unit 3 site layout showing both temporary and permanent facilities (see Figure 2.1-201 and Table 4.3-201), the proposed site plan reduces the overall area to be disturbed by about ~~161~~133 ac., or ~~41~~34 percent of the original total, to a total of approximately ~~234~~262 ac. This estimated disturbed area includes ~~217~~245 ac. in uplands and 17 ac. in the bottomland. Of this area, permanent facilities would occupy about ~~132~~160 ac.~~)~~, or ~~56~~61 percent of the disturbed area, also indicating a reduction in areas used only temporarily during construction.

The NRC also estimated in NUREG-1817, Subsection 4.4.1.1 that the distribution of disturbance in uplands among cover types would be 43 percent, 31 percent, and 26 percent, for upland forests, upland fields, and previously disturbed areas, respectively. Based on analysis of the proposed Unit 3 footprint, the distribution now is ~~30~~37 percent, ~~9~~8 percent, and ~~54~~48 percent for the same cover types, respectively. This distribution substantially reduces the need to alter natural upland habitats by increasing the use, both temporarily and permanently, of previously disturbed areas.

~~None~~Approximately 28 ac. of the upland forest to be cleared occurs in the South Woods portion of the site (described in Subsection 2.4.1.1) where biodiversity is high. This attribute is enhanced by complex topography that consists of a series of narrow ridges with steep slopes, ravines, and bluffs as described in Subsection 2.4.1. The oak-elm-hickory stands found there, while a valuable wildlife habitat, are common in the general area.

Clearing upland forest to accommodate construction parking areas (28 ac.) and the new on-site transmission line and new switchyard (38 ac). account for ~~94~~67 percent of the loss of forested cover. Most of these stands occur along the margins of areas that were previously disturbed or cleared during construction of Unit 1. This results in a relatively small loss of the total amount of high quality upland forest habitat on the site. This loss represents a negligible impact regionally, and a SMALL impact on the overall quality of upland habitat on the site.

The extent of new off-site transmission line construction is described in Section 3.7. Figure 2.2-201 is a map of the proposed ROW. Terrestrial habitats impacted by new and expanded ROW construction based on current alignments are described in Table 2.2-201. The NRC staff concluded in NUREG-1817 Subsection 4.4.1.2 that doubling the existing Baxter-Wilson and Franklin transmission corridors would result in MODERATE impacts to terrestrial habitats, and that creation of one or more new corridors could range from MODERATE to LARGE impacts. The proposed new transmission line construction includes creating a new 200-ft. corridor for the north-south portion of the line and expanding existing ROW width by 200 ft. along the east-west portion of the new line. Therefore, the NUREG-1817 conclusion of MODERATE to LARGE impacts to wildlife habitat is appropriate for the proposed new lines.

4.3.1.2 Wetlands

An unresolved item in NUREG-1817, Subsection 4.4.1.1, concerns the width and centerline location of the proposed new water intake pipeline ROW and the extent to which the ROW encroaches into wetlands in the bottomland. As shown in Table 4.3-201, recent delineation of the wetlands within the 100-ft. wide pipeline ROW and the expanded intake structure area on the bank of the river revealed that construction of these facilities is expected to impact about 17 ac. of wetland habitat. Within this area, 5 ac., or 31 percent are palustrine forested wetland, 0.6 ac., or 4 percent are palustrine shrub-scrub wetland, and 10.9 ac., or 65 percent are palustrine emergent wetland. The 17 ac. of wetlands impacts, when compared to the over 995 ac. of total wetlands within the GGNS site boundary, are considered to be SMALL. Authorization to construct within wetlands is expected to be obtained from the USACE under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Mitigation of permanent wetland losses is expected to be a condition of this authorization. BMPs to prevent and mitigate impacts to the aquatic ecosystem also are expected to be required by the MDEQ in that agency's water quality certification of the USACE permit.

Wetland habitats potentially affected by new transmission line construction are estimated to be 90 ac. or about 7 percent of the total ROW created as a result of Unit 3. This estimate is based on a GIS analysis of land use types within the proposed new ROW that are likely to contain wetlands as described in Section 2.2. No field delineation of wetlands in the ROW has been made as part of this estimate. Actual impacts to wetlands resulting from transmission line construction are primarily associated with the construction of tower foundations as may be required in wetland areas. Thus the impacts would be limited to the tower footprint in emergent and shrub-scrub wetlands. Construction in forested wetlands would result in complete loss of these wetland habitats due to the need to permanently clear the ROW for maintenance access. Usually the forested wetlands are converted to emergent or shrub-scrub wetlands, however these are considered inferior to forested wetlands when considering relative function and values of wetland types. USACE permits are required for any discharge of fill material in jurisdictional wetlands and appropriate mitigation is expected to be a condition of these permits, typically resulting in no net

TABLE 4.3-201 (Sheet 1 of 2)
ACREAGE OF COVER TYPES TO BE CLEARED OR OTHERWISE DISTURBED DURING NEW CONSTRUCTION AT THE GRAND GULF NUCLEAR STATION, CLAIBORNE COUNTY, MS

Plant Feature	Estimated Size	Previously Cleared/ Developed	Upland		Bottomland (Wetlands)		
			Forest	Field	Forested	Shrub-Scrub	Emergent
Construction							
Construction Overflow Parking	~~36.4~~36		~~18.2~~18	~~18.2~~18			
Construction Parking	~~29.8~~30	~~19.9~~20	~~9.9~~10				
Construction Laydown	~~26.6~~27	~~26.6~~27					
Aggregate Stock Pile	~~5.1~~5	~~5.1~~5					
Office and Warehouses	~~3.2~~3	~~3.2~~3					
Batch Plant	~~1.2~~1	~~1.2~~1					
Sub-total	~~102.3~~102	~~56.0~~56	~~28.1~~28	~~18.2~~18			
Operation							
On-Site Transmission Lines	~~35.1~~35	~~5.3~~5	~~26.7~~27	~~3.1~~3			
Powerblock	~~29.7~~30	~~29.7~~30					
Switchyard	~~19.3~~19	~~8.0~~8	~~11.3~~11				
Water Pipeline ROW	~~16.6~~17	~~9.1~~9	~~1.1~~1		~~5.2~~5	~~0.6~~1	~~0.6~~1
Cooling Towers/Clarifier	~~12.8~~13	~~12.8~~13					

TABLE 4.3-201 (Sheet 2 of 2)
ACREAGE OF COVER TYPES TO BE CLEARED OR OTHERWISE DISTURBED DURING NEW CONSTRUCTION AT THE GRAND GULF NUCLEAR STATION, CLAIBORNE COUNTY, MS

Plant Feature	Estimated Size	Previously Cleared/ Developed	Upland		Bottomland (Wetlands)		
			Forest	Field	Forested	Shrub-Scrub	Emergent
Water Intake/Barge Dock	~~12.4~~12	~~2.1~~2					~~10.3~~10
Enlarge Entry	~~3.3~~4	~~0.5~~1	~~2.8~~3				
Support Buildings	~~2.3~~2	~~2.3~~2					
Spoils Disposal	28	0	28				
Sub-total	~~131.5~~160	~~69.8~~70	~~41.9~~70	~~3.1~~3	~~5.2~~5	~~0.6~~1	~~10.9~~11
Total	~~233.8~~262	~~125.8~~126	~~70.0~~98	~~21.3~~21	~~5.2~~5	~~0.6~~1	~~10.9~~11
% of Total	~~100.0~~100	~~53.8~~48	~~29.9~~37	~~9.1~~8	~~2.2~~2	~~0.3~~1	~~4.7~~4

Grand Gulf Nuclear Station, Unit 3
COL Application
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TABLE 10.1-201 (SHEET 1 OF 2)
CONSTRUCTION-RELATED UNAVOIDABLE ADVERSE IMPACTS

Impact Category	Adverse Impacts Based on Applicant's Proposal	Actions to Mitigate Impacts[1]	Unavoidable Adverse Impacts
Land Use	During construction, ~~234~~262 ac. of land would be altered and converted, with the potential for erosion (Subsection 4.1.1); 132 ac. would be permanently occupied by structures and impervious surfaces, and 28 ac. would be used for spoils disposal (Subsection 4.1.1). This land would not be available for other uses. Impacts would include the removal of existing vegetation, large volumes of construction spoils/borrow, dewatering, dredging, grading, and excavation.	Adjust grade elevations in the parking, construction laydown, and batch plant areas to minimize net gain/loss of spoils materials. Deposit materials on the GGNS site and follow best-management practices in the handling of the material.	The construction of Unit 3 would temporarily or permanently ~~altered~~alter ~~234~~262 ac. of habitat; ~~132~~160 ac. would be occupied on a long-term basis by the nuclear power plant and associated infrastructure.
	Construction of off-site transmission right-of-way corridor in previously undisturbed land. It is estimated that 1333 ac. will be affected (Table 2.2-201).	Control dust and operate heavy machinery during daylight hours. Use of best management and standard industry practices, and following applicable laws and regulations pertaining to ground-disturbing activities, such as forest and wetlands protection and stormwater controls.	The conversion of previously undisturbed land into a transmission corridor would be an unavoidable adverse impact.

TABLE 10.4-204 (SHEET 3 OF 4)
SUMMARY OF PRINCIPAL BENEFITS AND COSTS FOR CONSTRUCTING AND OPERATING UNIT 3

Attribute	Benefits
Socioeconomic	Increased tax revenues generated directly and indirectly by plant construction and operation more than offset socioeconomic costs. Increased tax revenue supports improvements to public infrastructure and social services. Increased taxes and revenue spurs future growth and development. (Subsection 10.4.1.1.1)
Attribute	**Costs**
Capital and Operating Costs	Overnight Capital Costs are estimated at $3250 to $4000 per KWe as a reasonable estimate. Construction costs have been estimated at $5.2 billion to $6.5 billion. (Subsection 10.4.2.1.1) Levelized operational costs are estimated at $50 to $60 per MWh. (Subsection 10.4.2.1.2)
Aesthetics	Produces a relatively small vapor plume that can obscure the viewscape. (Subsection 10.4.2.2.3)
Fossil Fuel Supplies	Consumes finite supplies of uranium. (Subsection 10.4.2.2.7)
Land and Land use	Unit 3 would occupy approximately ~~234~~262 acres of the approximately 2100-acre existing GGNS site. (Subsection 10.4.2.2.1)
Hydrological and Water Use	Consumes some water. Produces a thermal plume and small amounts of hazardous/ radioactive waste are discharged into the Mississippi River after treatment. (Subsection 10.4.2.2.2)
Terrestrial and Aquatic Species	Some cost to wildlife due to mortality as a result of construction and operation of the plant. (Subsection 10.4.2.2.4)

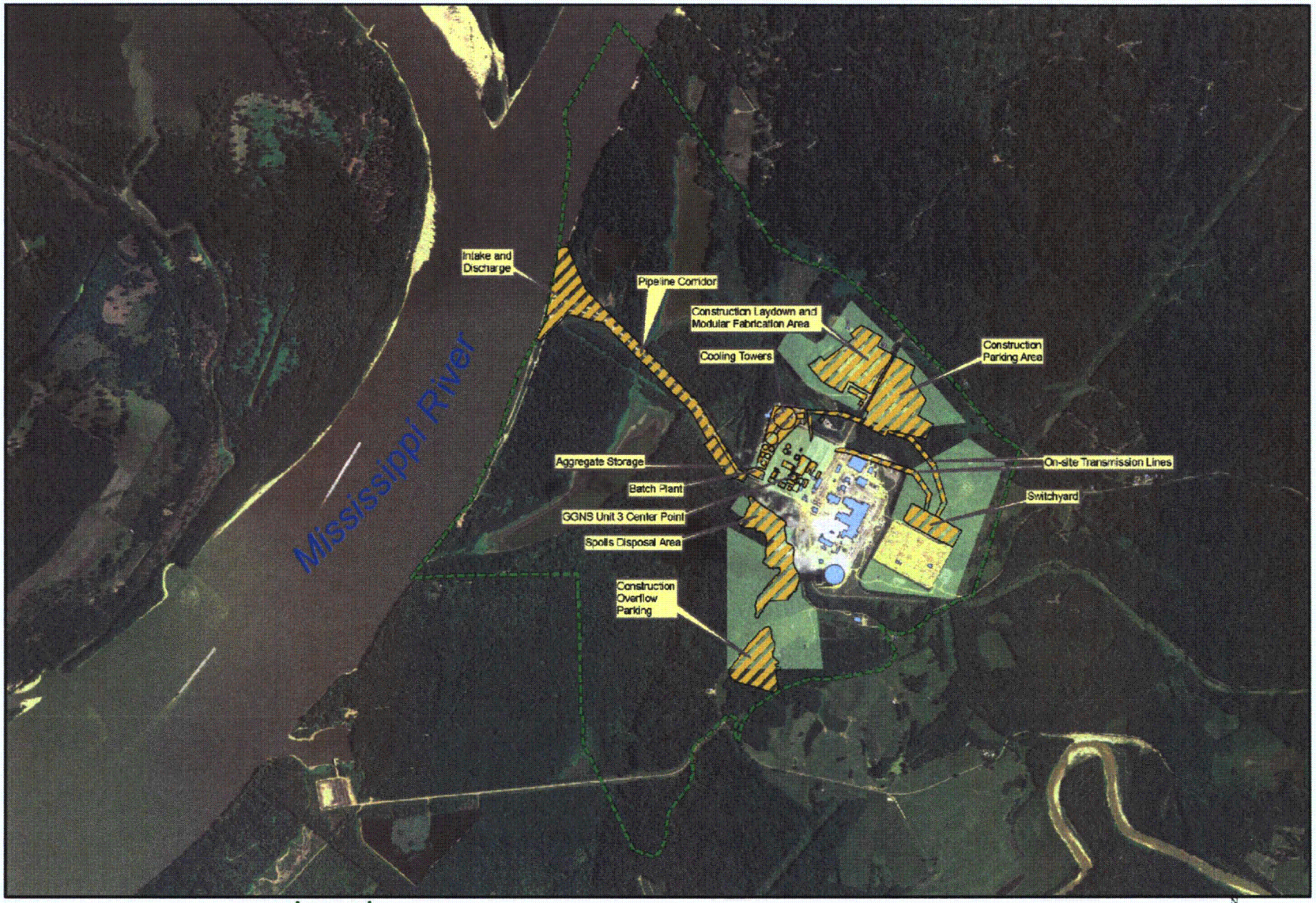

FIGURE 2.1-201. GGNS Site and Facility Layout

ATTACHMENT 10

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #10

RAI QUESTION NO. 10

NRC RAI Item #10

Item	ESRP/ER Section	RAI	Supporting information
TERRESTRIAL ECOLOGY			
10	ESRP Section 5.6.1	Provide information on water pipeline ROW maintenance.	Indicate whether water pipeline ROW maintenance will differ from proposed transmission corridor maintenance and, if so, how.

Entergy Response

The proposed GGNS Unit 3 makeup water pipeline corridor is described in GGNS Unit 3 COLA ER Section 2.4.1.2.1, with the pipeline route depicted in FSAR Figure 2.4-201, Sh. 2.

The GGNS Unit 1 makeup water pipeline is an underground pipeline that runs roughly parallel to the heavy haul road on the south side of the road (see FSAR Figure 2.4.1-201, Sh. 2). This pipeline is buried, with vents and access structures at several points in the corridor, along its length. The corridor area, which is approximately 40-50 feet wide above the pipeline, is regularly mown to keep trees and brush from reestablishing. It is anticipated that the Unit 3 makeup water pipeline corridor would be maintained in a similar fashion to the GGNS Unit 1 makeup water pipeline.

The primary focus of the vegetation management for the pipeline corridor area is to manage regeneration of trees and large shrubs to minimize the potential of interaction of above ground vegetation and associated root networks with the pipeline, vents, and access structures. As noted above, the Unit 1 pipeline corridor is routinely mown. However, other methods, similar to those used for transmission line right-of-way maintenance may be used, as required. Vegetation maintenance would be limited to the corridor area, thereby minimizing permanent alteration of floodplain vegetation (per ESP ER Section 4.3.1.2).

Proposed COLA Revision

None

ATTACHMENT 11

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #11

RAI QUESTION NO. 11

NRC RAI Item #11

Item	ESRP/ER Section	RAI	Supporting information
TRANSMISSION CORRIDORS			
11	Land Use ER Sections 2.2, 3.7	Provide information that is available on the following regarding the **proposed** transmission line corridors: • Any routing locational detail that can be provided (topographic, cadastral maps) in addition to Environmental Report (ER) Figure 2.2-201; • Potential restrictions on development associated with projected access corridors to both plant and transmission lines, including rights of way; • Limits to proposed access to transmission or access corridors due to maintenance or seasonal uses (agricultural); • Volume of merchantable timber that is expected to be harvested for commercial use from the proposed transmission corridor; • Expected transportation access to the corridors for construction and for timbering activities; and • Any "forest and wetlands protection and stormwater controls" measures that would be utilized during construction of the proposed transmission corridor.	Transmission line impacts were left unresolved at the early site permit (ESP) stage.

Entergy Response

The following information is being provided in regard to the proposed transmission line corridors. The requested information is provided in numbered format below, in the same sequence as the bulleted questions.

1. In addition to ER Figure 2.2-201, available Geographic Information System (GIS) layers containing transmission line routing locational detail (topographic, cadastral maps) were provided on a DVD via Entergy letter CNRO-2008-00023, dated July 24, 2008, in response to NRC Site Environmental Audit Request LU1.

2. Entergy obtains easements, as necessary, for access to its transmission lines. These easements would not control or direct development associated with this access. Entergy would be allowed to maintain the access roads to the transmission line under the terms of the easement, but further development of the access corridors is neither authorized nor prohibited by the easement documents. The easements do not restrict development of these areas or real estate parcels except to the extent that such development would interfere with the use of the right-of-way itself as allowed in the easement. For example, property owners may agree not to build houses or barns on the right-of-way that would interfere with Entergy's use of the easement, or adjacent to the right-of-way that would violate electrical codes for required clearances. The easement thus acts as a dominant right to use of the land, but only to the extent and for the purpose allowed by the easement. Any use of the land that does not conflict with the use as a right-of-way is not proscribed or controlled by Entergy or through the easement.

3. Based on previous operational experience and associated easement agreements, Entergy does not anticipate that the transmission lines and associated right-of-way will preclude productive use of land or interfere with land uses (e.g., cultivation). The presence of transmission lines themselves does not cause additional permanent loss of farmland (in the sense that farmland is lost, for example, to parking lots and buildings during urban development). In addition, the construction of buildings or any other permanent structures that could interfere with transmission line operation is typically prohibited by the easement agreement on a power line right-of-way. In contrast, several land uses are allowed to occur on a right-of-way and are usually not restricted by the easement, such as agricultural cultivation, irrigation and roads. Any restrictions on land use within the corridor right-of-way and/or ingress/egress activities for maintenance purposes would be imposed and compensated for, as necessary, as specified in the Entergy easement agreement. Therefore, there are no significant limits anticipated as it relates to access to transmission corridors due to maintenance or seasonal uses.

4. The proposed transmission line corridor would primarily transect what is best described as an upland mixed pine and hardwood forestland habitat type. A cursory assessment of the potential corridor alignments revealed very diverse timber stand conditions with various hardwood species types present, upland pine sites, and various timber stand stocking conditions. In addition, there are lesser amounts of bottomland hardwood forestland habitats that would be transected within the Big Black River Drainage Basin and its associated tributaries. The predominant forestland habitats found within the general area reflect the full range of forest management practices and the associated timber stand types that have developed over time. These timber stand conditions include what can be described as fully stocked timber stands, loblolly pine plantations and parcels that have been clear cut with all merchantable timber removed during harvesting activities. The variations within the timber stand conditions across the project area are very diverse and represent typical conditions found across the south-central portion of the State of Mississippi.

   The area the proposed transmission line corridor would transect contains, on average, approximately 1149 cubic feet of commercial sawtimber per acre and an additional approximately 1672 cubic feet of commercial pulpwood volume per acre. These estimated volumes are based upon the most recent (2002) statewide forest inventory sampling conducted by the Mississippi Institute for Forest Inventory (MIFI) and the

regional averages developed for the Southwest District of the State of Mississippi. Based upon the diversity of the timber stand conditions found within the project area, it appears that these inventory volumes would adequately reflect the volumes present within the proposed project area.

5. Entergy typically uses existing roads, where possible, to access transmission line rights-of-way for timbering, construction, and maintenance activities. When roads are to be constructed, landowners are consulted concerning the construction methods and concerning whether the road should be removed when no longer needed. For most projects, road width can be limited to a lane of approximately eight feet. Roads constructed of wooden mats may be preferable to dirt or rock roads in places such as agricultural lands where cultivation is expected to occur. Entergy obtains an easement across private lands for the transmission line right-of-way which carries an obligation to the landowner to return the used easement to a condition as good as or better than initially found by Entergy.

6. Forest and wetland protection and stormwater controls would be utilized as follows. Entergy employs storm water pollution prevention best management practices on the transmission line construction component of the project that are protective of wetlands and other waters of the United States, both within and adjacent to the boundaries of the transmission line corridor, in accordance with the MDEQ Large Construction General Permit Conditions T-1 through T-11. This permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) that includes (i) erosion and sediment controls for storm water, (ii) non-storm water discharge management, and (iii) housekeeping measures. The erosion and sediment controls are required, to the extent practicable, to divert up-slope water around disturbed areas of the site through the use of structural elements such as hay bales, silt fences, check dams, or drainage swales; to limit the exposure of disturbed areas to the shortest amount of time as possible; to minimize the amount of surface area that must be disturbed; to implement best management practices (BMPs) to mitigate adverse impacts from storm water runoff; and to remove sediment that would contribute to or cause adverse impacts to state waters from storm water before it leaves the site.

   Per the MDEQ Large Construction General Permit, existing vegetation must be preserved where possible, and revegetation is required as soon as practicable (within seven days for an area where vegetation is removed but that will remain undisturbed for thirty days thereafter). Housekeeping activities (such as the provision of sufficient fueling areas, storage areas, and trash receptacles) are required to prevent pollutants such as paint, solvents, chemicals, sanitary waste, or trash from entering the storm water discharge.

   Entergy complies with specific company construction specification manuals to satisfy the MDEQ general permit and SWPPP requirements for erosion and sediment control and for revegetation (seeding, fertilizing, and mulching). Implementation of these measures, coupled with restricting vehicle tracking and vegetation removal to the transmission corridor to the maximum extent practicable, protects forests and wetlands during construction of the transmission corridor. It should be noted that vegetation clearing will be accomplished utilizing above grade vegetation removal practices with the exception of line support structure foundations. Earthmoving activities would likely be restricted to

foundation excavation areas and the appropriate siltation/erosion control BMPs would be utilized as dictated by site-specific conditions.

Entergy specifications for construction of transmission line access roads allow access roads to be built as simple dirt roads by the removal of vegetation when the native soils will bear the traffic load. Entergy specifications apply the following techniques for transmission line access, to be utilized as considered appropriate for the specific terrain, land use, and conditions:

a. Gravel and rock roads would be constructed where wet weather, terrain, or other conditions require.

b. Culverts would be used, when necessary, and are preferred to the construction of bridges, except where temporary bridges are feasible and will avoid the dredge or fill of waters of the United States.

c. Installed drainage facilities would be removed when no longer needed for access, unless the landowner gives consent for these facilities to remain in place.

d. Road contractors would be instructed to consult the responsible Entergy engineer for any measures to mitigate environmental damage before proceeding with any road construction.

Proposed COLA Revision

None

ATTACHMENT 12

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #12

RAI QUESTION NO. 12

NRC RAI Item #12

Item	ESRP/ER Section	RAI	Supporting information
TRANSMISSION CORRIDORS			
12	Land Use ER Section 4.1.2	Identify any information available on protected wetlands impacted by the **proposed** transmission corridor and describe the nature of the impacts, local laws affecting wetlands, and impact mitigation requirements.	Transmission line impacts were left unresolved at the ESP stage.

Entergy Response

Routing information for planned transmission lines was not provided in the GGNS Early Site Permit (ESP) application Environmental Report (ER). Therefore, construction impacts on off-site land use were considered to be unresolved at ESP (NUREG-1817, Section 4.1.2, "Transmission Line Rights-of-Way and Offsite Areas." In addition, the NRC staff concluded in NUREG-1817, Section 4.4.1.5, "Terrestrial Ecosystems Impact Summary," that transmission line construction impacts on wildlife habitat (including wetlands) were unresolved at ESP.

The proposed transmission line corridor (COLA ER Figure 2.2-201) will transect a primarily upland forestland habitat type running north from the plant site through Claiborne County, Mississippi, to the eastern portion of Warren County, Mississippi. From there, the proposed transmission line corridor would run easterly into Hinds County, Mississippi through what is also primarily an upland forestland habitat type with interspersed agricultural open field areas. Anticipated wetland impacts along the proposed transmission line corridor would be relegated to tower support structure placements and for access during the line construction activities. The majority of the anticipated wetland impacts would be associated with the intermittent and perennial stream crossings that provide natural storm water flows through the predominant upland habitat types. Anticipated wetland impacts would be minimal due to the nature of the construction activities, the limited amount of actual filling/grading that could potentially take place, and the limited amount of potential wetlands impacted. (COLA ER Section 4.3.1.2 indicates only about 7 percent of the entire proposed corridor is mapped as having wetland characteristics.) The transmission line construction standards utilized by Entergy typically limit clearing activities in and around stream crossings to hand clearing methods, generally limiting use of mechanical clearing activities to upland areas. In addition, standard design features include limiting placement of tower support structures within upland areas as opposed to jurisdictional wetland areas where possible. Given the operational standards for transmission line construction, minimal wetland impacts would be anticipated within the proposed corridor area.

Because the proposed transmission line route has not been finalized and is still subject to change, no on-site field studies (including wetland delineations) to identify specific project impacts have been performed, and specific impact mitigation requirements have, therefore, not been established.

The jurisdictional wetland areas that are likely to be impacted by construction of the proposed transmission line would primarily be associated with stream crossings. As stated above, Entergy's standard protocol is to limit clearing activities in and around stream crossings to hand clearing methods. In addition, the majority of the project impacts would be due to clearing activities. Minimal grading/fill activities within wetland areas are expected as tower support structures are sited within upland areas where possible, as noted earlier. Given this, wetland mitigation requirements would typically be associated with impacts to those jurisdictional wetland areas classified as forested wetlands, which would become open field-type (emergent) wetlands due to vegetation clearing within the right-of-way. Mitigation is typically required for this type of impact to replace the functional values lost from the forested wetland conversions. The U.S. Army Corps of Engineers (USACE) Vicksburg District utilizes what is referred to as the Charleston District Wetland Mitigation Methodology to determine the mitigation requirements based upon the type of habitats that would be impacted. Any required mitigation for these impacts would likely be accomplished, with consultation and approval from the USACE, through either a) mitigation credits purchased from a mitigation bank, such as the Big Black Mitigation Bank in Madison County, Mississippi; or b) restoration mitigation through third-party establishment of a mitigation covenant at an approved off-site location. Entergy is not aware of any local laws affecting wetlands.

A description of potential wetland impacts from construction of the proposed Unit 3 off-site transmission line, and applicable regulations concerning wetland impacts, are provided in the COLA ER: Section 2.2.2, "Transmission Corridors and Off-Site Areas;" Section 2.4.1.1, "Terrestrial Habitats;" and Section 4.3.1.2, "Wetlands."

Proposed COLA Revision

None

ATTACHMENT 13

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER
DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #13

RAI QUESTION NO. 13

NRC RAI Item #13

Item	ESRP/ER Section	RAI	Supporting information
		TRANSMISSION CORRIDORS	
13	Land Use ER Section 4.1.2	Please provide information available as to the status of National Park Service (NPS) reviews of the **proposed** right-of-way crossing of the Natchez Trace National Historic Parkway, and the following related information: • Any information on the potential NPS National Environmental Policy Act of 1969 (NEPA) process associated with the Natchez Trace crossing of the proposed transmission corridor; and • Any mitigation measures the NPS is requiring to allow siting the proposed transmission corridor.	Transmission line impacts were left unresolved at the ESP stage.

Entergy Response

The issue of off-site impacts on land use due to transmission line construction was unresolved in NUREG-1817, Section 4.1.2. As discussed in COLA ER Section 1.1, additional transmission right-of-way (ROW) will be necessary to support the new GGNS Unit 3. A proposed transmission line route and corridor was presented and discussed in ER Section 2.2.2 (see ER Figure 2.2.-201) and Section 3.7. Additional information on off-site land use impacts of transmission line construction is provided in ER Section 4.1.2. Although a proposed route is discussed in the ER, the decision to construct the new unit or the supporting, additional transmission line to transmit electricity from Unit 3 has not been made, and the final route of any potential new line has not yet been determined. As such, consultation with the National Park Service (NPS) is still in the preliminary stages. Therefore, the NPS NEPA process for approval of the proposed transmission line crossing has not yet begun, and no mitigation measures have been agreed to between NPS and Entergy. The following information is provided to describe the permitting process typically required by the NPS for transmission line crossings.

The NPS may issue ROW permits through parks for electric power under the authority found in 16 USC 5, 79. NPS general regulations regarding ROW permits are located at 36 CFR Part 14. ROW permitting is required to be conducted in accordance with directives for NEPA compliance outlined in the Department of the Interior Environmental Quality Programs Departmental Manual, and the NPS Director's Orders.

Permits may be issued to authorize new utilities or to renew, amend or convert other documents to ROW permits for existing utilities. Informational requirements to support ROW permits are determined on a case-by-case basis and applicants are obligated to consult with the Park Superintendent before making formal application for new or amended utility ROW. Applicants must provide sufficient information on the proposed non-park use, as well as park resources and resource-related values to be affected directly and indirectly by the proposed ROW to allow the NPS to evaluate the application, assess the impact of the proposed ROW, develop restrictions and stipulations to mitigate impacts, and reach a decision on the issuance of the permit. Applicants are typically required to describe the effects that the proposed project will have on air quality, visual impact, surface and ground water quality and quantity, control or structural change on water bodies, existing noise levels, and surface of the land, including vegetation, soil and soil stability. Probable effects on fish, plant life and wildlife, including threatened and endangered species, may also be described in ROW applications.

Permit conditions are typically established to protect NPS and public interests, including park resources and values. Conditions may include measures to prevent or minimize damage to park resources including restoration, soil protection measures, and landscaping, in addition to restrictions on removal and disposal of vegetation and the use of pesticides and herbicides. ROW permits typically specify actions to be taken upon discovery of threatened or endangered species or archaeological, paleontological, or historical findings.

Mitigation measures are determined on a case-by-case basis and could potentially include vegetative or other screening techniques to reduce visual impact or modifications to existing Entergy electric utility ROW as an offset to the impact of a new ROW.

Proposed COLA Revision

None

ATTACHMENT 14

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #14

RAI QUESTION NO. 14

NRC RAI Item #14

Item	ESRP/ER Section	RAI	Supporting Information
TRANSMISSION CORRIDORS			
14	Aquatic Ecology ER Section 5.6.2	Provide information on **existing** transmission line right-of-way (ROW) maintenance procedures in areas of special/sensitive areas (e.g., at river crossings and wetlands).	In NUREG 1817, the information provided by Entergy Services concerning ROW maintenance procedures implied that "procedures generally consist of mechanical means (primarily bushhogging)". No new information was provided in the COLA ER to imply that other procedures, e.g., herbicide applications, were being used for ROW maintenance. During the transmission line tour at the site audit on June 17, 2008, bushhogging or other mechanical procedures were not the primary procedure observed across the Big Black River and around wetlands below the transmission line. Describe the maintenance procedures that will be used for special/sensitive areas for all proposed transmission lines.

Entergy Response

Although not specifically discussed in the COLA ER, discussions pertaining to the use of herbicides, as well as mechanical means, for maintaining transmission line rights-of-way (ROW) are provided in NUREG-1817, *Environmental Impact Statement for an Early Site Permit (ESP) at the Grand Gulf ESP Site*; specifically in Section 2.7.1.1, "Biological Communities," Section 4.4.1.2, "Wildlife Habitat along the Transmission Line Rights-of-Way," and Section 5.4.1.10, "Summary of Terrestrial Ecosystem Impacts."

NUREG-1817, Section 5.4.1.10, found that the potential impacts of transmission line ROW maintenance (cutting and herbicide application) and similar impacts on floodplains and wetlands, birds, and biota due to electromagnetic forces (EMFs) and any related impacts on State-listed species would be considered negligible. The NRC staff reviewed the potential terrestrial ecological impacts of a new generation facility at the Grand Gulf ESP site including transmission lines and associated ROW maintenance. The NRC staff concluded that the impacts from operation of the Grand Gulf ESP facility would be SMALL, and additional mitigation beyond that mentioned in the text would not be warranted.

NUREG-1817, Section 5.4.2, specifically evaluated potential impacts on the aquatic ecosystem from operation of the proposed new facility, including consideration of impacts on aquatic ecosystems associated with transmission line ROW maintenance activities. Specifically, the NRC staff concluded in Section 5.4.2.4 that ROW maintenance would have

minimal impacts on aquatic ecosystems. Section 5.4.2.6 summarizes impacts on aquatic ecosystems, which included consideration of transmission ROW maintenance and found that impact from operations would be SMALL.

While the herbicides are not specifically mentioned in NUREG-1817, Section 5.4.2.6, Entergy understands from Sections 2.7.1.1, 4.4.1.2, 5.4.1.5, and 5.4.1.10 that the use of herbicides was recognized as one of several methods that could be used for vegetation management.

Based on the above conclusions in NUREG-1817, and as noted in ER Sections 5.6.1 and 5.6.2, Entergy considers the subject of ecological impacts from transmission ROW maintenance to be resolved at ESP. However, additional information pertaining to vegetation management practices is provided below.

Vegetation Management Practices

Entergy follows industry standards and practices when managing vegetation on transmission line ROWs. Entergy uses both mechanical and hand-clearing methods (trimming, pruning, tree removal, and mowing) as well as herbicide applications to manage ROW vegetation. The appropriate method is chosen based on public safety, personnel safety, long-term cost effectiveness, and impact to the environment. Each method is discussed below. It is anticipated that these methods would also be used for maintenance in special/sensitive areas for the proposed transmission lines.

- Mechanical and Hand-Clearing Methods

  Entergy uses various types of treatments to control and manage ROW vegetation, including hand-clearing, cutting, pruning, trimming, tree removal, and mowing using manual crews on the ground and with bucket trucks with aerial lifts. These activities are performed in accordance with current specifications and arboricultural standards. Larger trees are generally trimmed or pruned to achieve adequate clearances from transmission lines. Mowing small trees and other woody vegetation at or near ground level may be performed to prepare the area for follow-up herbicide treatments (discussed below) and to control vegetative growth in the ROW. In special/sensitive areas (i.e., streams, ditches, ponds, or other easily erodible areas) maintenance is performed in a manner that minimizes or prevents erosion. Appropriate ground cover (for example: re-seeded grasses, straw or rock) may be added to minimize erosion.

- Herbicide Application

  Entergy employs manual personnel on foot, equipped with backpack sprayers as the standard method when applying herbicides for managing vegetation in wetland and aquatic habitat areas along transmission line ROWs. Entergy believes this manual application approach to be the most unobtrusive method, allowing selective-type herbicides to be applied safely, effectively, and with limited impact to the environment. Other application methods may be used when conditions warrant (e.g., personnel safety threatened by unstable terrain or in areas that are difficult to access). In special/sensitive areas (i.e., areas around or near wetlands or water bodies), Entergy only uses herbicides specifically approved for wetlands and aquatic area applications as specified on the herbicide's specimen label and the material safety data sheet. Entergy only employs

contractors with state-approved herbicide licenses by the Department of Agriculture for each state. Also, all herbicides are EPA-approved and must follow the label's application directions for use. Entergy does not use aerial applications of herbicides near nuclear facilities.

Proposed COLA Revision

None

ATTACHMENT 15

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #15

RAI QUESTION NO. 15

NRC RAI Item #15

Item	ESRP/ER Section	RAI	Supporting information
TRANSMISSION CORRIDORS			
15	Terrestrial Ecology ESRP 2.4.1	Provide available "wildlife safe" project designs for **proposed** transmission line construction. Provide available information on precautions that will be taken when constructing transmission lines in threatened or endangered wildlife habitat?	Part B of Environmental Standard—Line or Substation Construction BMPs (June 2007 Rev. 2) lists construction BMPs for transmission lines. One of these mentions "wildlife safe" project designs for congregations of migratory birds, including raptors. Describe transmission line construction wildlife safe project designs that will be in use when constructing the new transmission line corridors. A second BMP mentions exercising "extreme care" when working in threatened or endangered wildlife habitat. What precautions (extreme care) will be taken to protect threatened or endangered species and associated habitat when constructing transmission lines?

Entergy Response

The issue of construction impacts on wildlife habitat along transmission right-of-way (ROW) was considered to be unresolved in NUREG-1817, Section 4.4.1.2. Some of the practices and procedures observed by Entergy that are intended to provide appropriate, prudent measures for protection of environmentally sensitive areas that could be involved in the planning and construction of transmission lines or substations are discussed in COLA ER Section 2.4.1.2, "Threatened and Endangered Terrestrial Species." Transmission line design information is provided in COLA ER Section 3.7.1, "Transmission Line Right-of-Way and Construction." Additional information on avian protection related to transmission line construction is provided below.

Project-specific wildlife-safe designs are not available at this time for transmission line design. Although Entergy looks to the Avian Power Lines Interaction Committee (APLIC)[1] suggested

[1] The APLIC is a partnership of utilities, resource agencies and the public to develop and provide educational resources; identify and fund research; develop and provide cost-effective management options; and serve as the focal point for avian interaction utility issues. Additional detail can be found at the organization's website: http://www.aplic.org.

practices for guidance in these matters, implementation of APLIC suggested practices for minimizing avian interactions with transmission are dictated by site- and case-specific need and cannot be specified until a specific line route is selected.

Entergy transmission line construction standards and practices provide a list of "triggers" for Entergy personnel involved in construction activities to seek guidance from the organization responsible for environmental impact oversight before proceeding with a planned action. The environmental oversight organization would secure the appropriate resources to ensure compliance with applicable regulations. In the instance of raptor protection, APLIC's "Suggested Practices for Avian Protection on Power Lines, the State of the Art in 2006," (Pier Final Project Report CEC-500-2006-022) is currently utilized as a resource for Best Management Practices (BMPs). Risk of electrocution posed to raptors from a 500-kV line is dramatically lower than that posed from line voltages of 69-kV and less. This is due to the electrical phase-to-phase and/or phase-to-ground separation distances required for design of higher voltage lines. Examples of "wildlife safe" project design elements that would be considered for use, and used if prudent, include "avian-safe design" elements listed in the APLIC 2006 guidance. As that document explains, "two basic considerations are conductor separation and grounding procedures. As with retrofitting, the objective is to provide a 150-cm (60-in) separation between energized conductors or energized hardware and grounded conductors/hardware. If enough separation is not possible, appropriate covers can be used to prevent simultaneous contact between energized and/or grounded facilities."[2] Also, to prevent electrocutions caused by arcing, APLIC recommends "conductor separation should be increased from 152 cm (60 in) by 0.5 cm (0.2 in) for each kV over 60 kV."[3] This equates to a horizontal spacing of 180 cm (71 in) for a 115 kV line. For a 138-kV line, a horizontal spacing of 192 cm (76 in) is suggested. If this cannot be achieved, insulation of critical components can be considered. Conductor separation on higher voltage lines is sufficient to avoid arcing from a conductor to a bird on the structure.[4] However, applying the APLIC separation guidance for a 500-kV line equates to a horizontal spacing of 376 cm (148 in). Typical design standards for 500-kV transmission lines, as indicated in COLA ER Figure 3.7-201, utilize a horizontal spacing from 1031 cm (406 in) to 1067 cm (420 in). This spacing meets the APLIC spacing recommendations as described above.

Examples of "extreme care" BMPs used when working in threatened or endangered wildlife habitat include Entergy line construction specifications that require the development of site-specific plans to avoid impact to threatened or endangered species. Depending on the species of concern, this plan could include noise abatement, light shielding or abatement, the avoidance of specific habitat areas (colonies, nests, or trees, etc.), or limitation of work during sensitive times in the species' growth or reproductive cycle. Similarly, if the construction project anticipates the "take" of a threatened or endangered species, an incidental take permit under the Endangered Species Act would be obtained, including a required habitat management plan.

Avoiding avian collisions with transmission lines is largely a function of avoiding important habitat areas when possible, avoiding the bisecting of resting and feeding areas for sensitive species when possible, and using devices such as bird diverters. As the route for the

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[2] APLIC 2006, pg. 61
[3] APLIC 2006, pg. 98
[4] APLIC 2006, pg. 98

transmission line is finalized, information would be gathered concerning the avian species and flight paths that are of concern to the project, if any. At that time, Entergy would make decisions on the most cost-effective measures to avoid significant avian interaction, including line design and spacing, tower design and spacing, and use of items such as bird diverters. It is important to note that the current 500-kV GGNS - Baxter Wilson transmission line serving GGNS Unit 1, which runs in the same general area as the proposed new line, has not raised avian interaction concerns since installation.

Proposed COLA Revision

None

ATTACHMENT 16

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER RAI ITEM #16

RAI QUESTION NO. 16

NRC RAI Item #16

Item	ESRP/ER Section	RAI	Supporting information
TRANSMISSION CORRIDORS			
16	Terrestrial Ecology ESRP 4.3.1. and 5.6.1	Regarding vegetation clearing for **proposed** transmission corridors, provide available information on the following: • A description of how easily erodible areas will be cleared in order to minimize or prevent erosion, • An example list of species to be reseeded and indicate any non-native species, and • The State Environmental Stormwater Pollution Standards that will be met. Indicate if the above answers that pertain to transmission corridor clearing differ from clearing onsite for permanent facilities or for temporary (borrow and staging areas, etc.) facilities and, if so, how. Also, after the initial vegetation clearing of transmission corridors, provide available information as to the proportion of mechanical reclearing to chemical herbicide applications to be employed to keep ROWs clear of woody vegetation?	Initial Vegetation Clearing of Transmission Corridors (last revised 11/29/94) states that, "Streams, ditches, ponds or other easily erodible areas should be cleared in a fashion that will minimize or prevent erosion. Re-seeding with an appropriate ground cover may be required. Re-seeding shall be done as recommended by the State's Soil Conservation Service. All clean-up methods must meet State Environmental Stormwater Pollution Standards." Describe how easily erodible areas (including streams and wetlands) in new transmission line corridors will be cleared in order to minimize or prevent erosion (i.e., BMPs). Provide an example list of species to be reseeded and indicate non-native species. Which are the State Environmental Stormwater Pollution Standards that will be met for the initial clearing of transmission corridors? Vegetation clearing onsite is likely to be similar in many ways to vegetation clearing for transmission corridors. Indicate if the above answers that pertain to transmission corridor clearing differ from clearing onsite for permanent (e.g., facilities) and temporary (borrow and staging areas, etc.) facilities and, if so, how. Initial Vegetation Clearing of Transmission Corridors also indicates how corridors are initially cleared of vegetation. Transmission Line Corridors "Mechanical Reclearing – Mowing" (last revised 6/17/98) indicates that corridors are recleared to prepare for follow-up chemical herbicide treatments. Transmission Line Corridors: Chemical Herbicide Applications" (last revised 1/10/02) discusses chemical herbicide treatments. After the initial vegetation clearing of

Item	ESRP/ER Section	RAI	Supporting information
			transmission corridors, what is the proportion of mechanical reclearing to chemical herbicide applications employed to keep ROWs clear of woody vegetation?

Entergy Response

Routing information for planned transmission lines was not provided in the GGNS Early Site Permit (ESP) application Environmental Report (ER). The NRC staff concluded in NUREG-1817, Section 4.4.1.5, "Terrestrial Ecosystems Impact Summary," that transmission line construction impacts on wildlife habitat (including wetlands) were unresolved at ESP.

Although not specifically discussed in the COLA ER, discussions pertaining to the use of herbicides, as well as mechanical means, for maintaining transmission line rights-of-way (ROW) are provided in NUREG-1817; specifically in Section 2.7.1.1, "Biological Communities," Section 4.4.1.2, "Wildlife Habitat along the Transmission Line Rights-of-Way," and Section 5.4.1.10, "Summary of Terrestrial Ecosystem Impacts."

NUREG-1817, Section 5.4.1.10, found that the potential impacts of transmission line ROW maintenance (cutting and herbicide application) and any related impacts on State-listed species would be considered negligible. The NRC staff reviewed the potential terrestrial ecological impacts of a new generation facility at the Grand Gulf ESP site including transmission lines and associated ROW maintenance. The NRC staff concluded that the impacts from operation of the Grand Gulf ESP facility would be SMALL, and additional mitigation beyond that mentioned in the text would not be warranted.

NUREG-1817, Section 5.4.2, specifically evaluated potential impacts on the aquatic ecosystem from operation of the proposed new facility, including consideration of impacts on aquatic ecosystems associated with transmission line ROW maintenance activities. Specifically, the NRC staff concluded in Section 5.4.2.4 that ROW maintenance would have minimal impacts on aquatic ecosystems. Section 5.4.2.6 summarizes impacts on aquatic ecosystems, which included consideration of transmission ROW maintenance and found that impact from operations would be SMALL.

While herbicides are not specifically mentioned in NUREG-1817, Section 5.4.2.6, Entergy understands from Sections 2.7.1.1, 4.4.1.2, 5.4.1.5, and 5.4.1.10 that the use of herbicides was recognized as one of several methods that could be used for vegetation management during facility operation.

Based on the above conclusions in NUREG-1817 referenced above, and as noted in COLA ER Sections 5.6.1 and 5.6.2, Entergy considers the subject of ecological impacts from transmission ROW maintenance to be resolved at ESP and no new and significant information has been identified. However, additional information pertaining to vegetation management practices is provided below.

Easily erodible areas are usually along stream or river banks that shed water quickly in rain events. Entergy typically limits clearing activities in and around stream crossings to hand clearing methods, with general limitations on mechanical clearing activities to upland areas. During initial construction clearing and subsequent maintenance activities, tree stumps in easily erodible areas are usually left intact to preserve the underlying root matrix, which inhibits soil erosion.

Once the area is cleared of woody vegetation, it is reseeded as soon as practicable (within seven days for an area where vegetation is removed but that will remain undisturbed for thirty days thereafter) with hulled and unhulled common Bermuda grass (*Cynodon dactylon*), lespedeza, weeping love grass, wheat, or crimson clover (or combinations thereof) depending on the planting time. All of the above-mentioned grasses used for re-seeding are non-native (introduced). These species establish a complex root matrix relatively quickly to protect the soil from erosion. Tilling is not typically performed on steep erodible slopes.

Entergy employs storm water pollution prevention best management practices (BMPs) on the transmission line construction component of projects that are protective of wetlands and other waters of the United States, both within and adjacent to the boundaries of the transmission line corridor, in accordance with the MDEQ Large Construction General Permit Conditions T-1 through T-11. This permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) that includes (i) erosion and sediment controls for storm water, (ii) non-storm water discharge management, and (iii) housekeeping measures. The erosion and sediment controls are required, to the extent practicable, to divert up-slope water around disturbed areas of the site through the use of structural elements such as hay bales, silt fences, check dams, or drainage swales; limit the exposure of disturbed areas to the shortest amount of time as possible; minimize the amount of surface area that must be disturbed; implement BMPs to mitigate adverse impacts from storm water runoff; and remove sediment that would contribute to or cause adverse impacts to state waters from storm water before it leaves the site.

Entergy follows industry standards and practices when managing vegetation on transmission line ROW. Entergy uses both mechanical methods (trimming, pruning, tree removal, and mowing) and herbicide application to manage vegetation. The appropriate method or combination of methods is chosen based on personnel safety, effectiveness, and impact to the environment. Proportions of techniques employed during vegetation management for a project vary according to the type, magnitude, and locations of individual projects.

Methods outlined above for transmission corridors are similar to techniques employed for on-site clearing. Areas where clearing is necessary are expected to be reseeded or otherwise protected if the ground is to remain uncovered to prevent the migration of topsoil during precipitation events. Entergy would be responsible for obtaining the necessary permits through MDEQ, which would include a SWPPP. The location of the project impact area would dictate methods used to maintain vegetation growth onsite.

Proposed COLA Revision

None

ATTACHMENT 17

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER DATED SEPTEMBER 8, 2008

RESPONSE TO ER ITEM #17

RAI QUESTION NO. 17

NRC RAI Item #17

Item	ESRP/ER Section	RAI	Supporting information
TRANSMISSION CORRIDORS			
17	Terrestrial Ecology ESRP 5.6.1	Provide available information as to guidelines that exist and will be followed for transmission lines associated with the Grand Gulf site which will minimize avian electrocutions and collisions?	Indicate specifically which guidelines in "Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006" are currently being followed on existing transmission lines and will be followed for new transmission lines for the new nuclear unit, which will minimize avian electrocutions and collisions. Also discuss the use of Rick Bewley's (Entergy Mississippi) perch protectors.

Entergy Response

NUREG-1817, Section 5.4.1.10, found, "The potential impacts of transmission line right-of-way maintenance (cutting and herbicide application) and similar impacts on floodplains and wetlands, birds, and biota due to EMFs and any related impacts on State-listed species are considered negligible. The staff reviewed the potential terrestrial ecological impacts of a new generation facility at the Grand Gulf ESP site including the associated heat-dissipation system, transmission lines, and associated right-of-way maintenance. The staff concludes the impacts from operation of the Grand Gulf ESP facility would be SMALL, and additional mitigation beyond that mentioned in the text would not be warranted." Based on the above conclusions in NUREG-1817, Entergy considers this subject to be resolved at ESP.

The issue of construction impacts on wildlife habitat along transmission right-of-way (ROW) was considered to be unresolved in NUREG-1817, Section 4.4.1.2. Some of the practices and procedures observed by Entergy that are intended to provide appropriate, prudent measures for protection of environmentally sensitive areas that could be involved in the planning and construction of transmission lines or substations are discussed in COLA ER Section 2.4.1.2, "Threatened and Endangered Terrestrial Species." Transmission line design information is provided in COLA ER Section 3.7.1, "Transmission Line Right-of-Way and Construction." Where available, additional information on transmission line practices intended to minimize avian electrocutions and collisions is provided below.

Project-specific transmission line design information is not available at this time for the proposed GGNS - Ray Braswell transmission line. Although Entergy looks to the Avian Power Lines Interaction Committee (APLIC) suggested practices for guidance in these matters, implementation of APLIC suggested practices for minimizing avian interactions with

transmission are dictated by site- and case-specific need and cannot be specified until a specific line route is selected.

The techniques discussed in the APLIC's "Suggested Practices for Avian Protection on Power Lines, the State of the Art in 2006," (Pier Final Project Report CEC-500-2006-022) document have been used by Entergy in areas where avian actions have been problematic. Space between lines has been increased and/or dielectric materials have been used as covers for energized parts when necessary. Visual bird diverters are used on some lines when necessary. Lines are not retrofitted where no avian mortalities are known to occur.

As noted in APLIC guidance, bird electrocutions occur less frequently on lines with voltages above 69 kV due to the conductor spacing and electrical insulation requirements being more inherently "bird-friendly" by reducing likelihood of electrical phase-to-phase and/or phase-to-ground bridging by birds perching on the lines. In general, perch protectors on high-voltage lines (greater than 69 kV) are utilized to redirect birds to perch on areas of the structure that are less prone to electrical short-circuits due to accumulation of bird feces on electrical insulators used on the structures.

Additional information on transmission line design practices intended to minimize avian impacts is provided in response to RAI Item #15.

Proposed COLA Revision

None

ATTACHMENT 18

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER
DATED SEPTEMBER 8, 2008

LIST OF FILES CONTAINED ON THE ENCLOSURE 1 CD-ROM

LIST OF FILES CONTAINED ON THE ENCLOSURE 1 CD-ROM

List of GIS Shape Files_RAI #7 – All publicly available

09/14/2008 10:32 AM	73 Bear Den Possible Location.dbf
09/14/2008 10:21 AM	424 Bear Den Possible Location.prj
09/14/2008 10:32 AM	132 Bear Den Possible Location.sbn
09/14/2008 10:32 AM	116 Bear Den Possible Location.sbx
09/14/2008 10:32 AM	460 Bear Den Possible Location.shp
09/18/2008 03:37 PM	9,067 Bear Den Possible Location.shp.xml
09/14/2008 10:32 AM	108 Bear Den Possible Location.shx
09/29/2008 02:59 PM	39,348 BlackBear_candidate_trees.dbf
09/29/2008 02:59 PM	424 BlackBear_candidate_trees.prj
09/29/2008 02:59 PM	420 BlackBear_candidate_trees.sbn
09/29/2008 02:59 PM	132 BlackBear_candidate_trees.sbx
09/29/2008 02:59 PM	940 BlackBear_candidate_trees.shp
09/29/2008 02:59 PM	340 BlackBear_candidate_trees.shx
09/29/2008 03:23 PM	73 Candidate Tree Area_North of Switchyard.dbf
09/29/2008 03:07 PM	424 Candidate Tree Area_North of Switchyard.prj
09/29/2008 03:23 PM	132 Candidate Tree Area_North of Switchyard.sbn
09/29/2008 03:23 PM	116 Candidate Tree Area_North of Switchyard.sbx
09/29/2008 03:23 PM	380 Candidate Tree Area_North of Switchyard.shp
09/29/2008 03:23 PM	108 Candidate Tree Area_North of Switchyard.shx
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09/29/2008 06:53 PM	128 Candidate_Tree_with_Potential_Bear_Cavity.shp
09/29/2008 06:53 PM	108 Candidate_Tree_with_Potential_Bear_Cavity.shx
09/13/2008 03:55 PM	155 white walnut.dbf
09/13/2008 01:16 PM	424 white walnut.prj
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09/13/2008 03:55 PM	108 white walnut.shx
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Total Files Listed:
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List of Figure 2.1-201 Draft Rev. 1 GIS Files - RAI #9 - All publicly available

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02/28/2008 03:53 PM	516 Const_Laydown_1.sbn
02/28/2008 03:53 PM	156 Const_Laydown_1.sbx
02/28/2008 03:53 PM	34,228 Const_Laydown_1.shp

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02/28/2008 03:54 PM 2,350 Const_Laydown_2.dbf
02/28/2008 03:54 PM 424 Const_Laydown_2.prj
02/28/2008 03:54 PM 260 Const_Laydown_2.sbn
02/28/2008 03:54 PM 132 Const_Laydown_2.sbx
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02/28/2008 03:54 PM 628 Const_Laydown_3.sbn
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07/16/2008 01:25 PM 4,676 ER Figure 2.1-201.mxd.xml
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65 File(s)	170,088,332 bytes	

Total Files Listed:

65 File(s)	170,088,332 bytes

ATTACHMENT 19

G3NO-2008-00001

RESPONSE TO NRC ER RAI LETTER
DATED SEPTEMBER 8, 2008

REGULATORY COMMITMENTS

REGULATORY COMMITMENTS

The following table identifies those actions committed to by Entergy in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE (If Required)
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
1. Environmental report Section 4.5 will be revised in a future COLA submittal to address the revision to the estimated construction worker dose, as discussed in Attachment 1, consistent with the revision to FSAR Appendix 12CC to be made in response to the NRC's request for additional information Letter No. 03, related to SRP Sections 12.03 - 12.04, for the Grand Gulf combined license application.	✓		Future COLA Submittal
2. The text of ER Sections 10.4.1.1.1, 10.4.1.1.2, 10.4.2.1.2, 10.4.2.2.1, and Tables 10.4-201, 10.4-203, and 10.4-204 will be revised as shown in the attached draft markups.	✓		Future COLA Submittal
3. ER Section 2.4.1.2.1 will be revised as indicated in the draft markup included with this attachment to further expand on the areas surveyed for rare plant species.	✓		Future COLA Submittal
4. ER Subsection 2.4.1.2.2 (Louisiana Black Bear) will be revised to correct the number and clarify the locations of candidate trees as indicated in the draft markup included with this attachment.	✓		Future COLA Submittal
5. ER Subsection 4.3.1.3 (Wildlife) will be revised to correct the number and clarify the locations of candidate trees as indicated in the draft markup included with this attachment.	✓		Future COLA Submittal

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE (If Required)
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
6. ER Figure 2.1-201 will be revised as indicated in the attached draft markup to show the proposed spoils disposal area in the South Woods, and to generally improve the labeling on the figure	✓		Future COLA Submittal
7. ER Sections 2.2.1, 2.4.1.1, 4.1.1, 4.3.1.1 and Tables 4.3-201, 10.1-201 and 10.4-204 will be revised as indicated in the attached draft markup to better define the South Woods, and to discuss spoils disposal in the South Woods.	✓		Future COLA Submittal

ENCLOSURE 1

G3NO-2008-00001

CD-ROM CONTAINING REQUESTED GIS FILES