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G1. Kentucky Division of Air Quality (Adams, T.L.)

From: Adams, Tom (EPPC DEP DAQ) [Tom.Adams@ky.gov]
Sent: Friday, May 25, 2007 2:18 PM
To: FutureGen.EIS@netl.doe.gov
Subject: PSD permitting for an IGCC

The commonwealth of Kentucky has had recent experience on permitting an IGCC unit. During our investigation, several minor concerns were noticed that might not be included in your draft EIS. If possible, we could certainly pass on our observations on an informal basis. **#1**

T.L. Adams
Ky Div of Air Quality.

G1. Kentucky Division of Air Quality (Adams, T.L.)

Response to Comment #1:	DOE contacted the Commentor to discuss recent experience of the commonwealth of Kentucky with regards to permitting an IGCC unit. It was determined that DOE would coordinate with the Kentucky Division of Air Quality during the site characterization and permitting phase.

G2. U.S. Department of the Interior (Chezik, Michael T.)

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Custom House, Room 244
200 Chestnut Street
Philadelphia, Pennsylvania 19106-2904

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

July 11, 2007

ER 07/465

Mr. Mark L. McKoy,
NEPA Document Manager
U.S. Department of Energy
National Energy Technology Laboratory
P.O. Box 880,
Morgantown, West Virginia 26507–0880

Attn: FutureGen Project EIS (DOE/EIS-0394D)

Dear Mr. McKoy:

The Department of the Interior (Department) has reviewed the May 2007 Draft Environmental Impact Statement (DEIS) for the FutureGen Project. The EIS provides information about the potential environmental impacts of the U.S. Department of Energy's (DOE's) proposal to provide federal funding to the FutureGen Alliance, Inc. (Alliance) for the FutureGen Project. The project would include the planning, design, construction, and operation by the Alliance of a coal-fueled electric power and hydrogen gas production plant integrated with carbon dioxide (CO2) capture and geologic sequestration of the captured gas. Four sites have been identified as reasonable alternatives and are considered in the EIS: (1) Mattoon, Illinois; (2) Tuscola, Illinois; (3) Jewett, Texas; and (4) Odessa, Texas. The Department offers the following comments and recommendations for your consideration.

GENERAL COMMENTS

#1 The DEIS is well written and provides a detailed evaluation of the four alternative sites and the environmental consequences of the proposed action. While we do not specifically recommend the selection of any particular site, we do recommend that full consideration be given to the site that would result in the least environmental damage. Where appropriate, DOE should require implementation of the possible mitigation measures discussed in the DEIS to avoid, minimize, and offset environmental harm.

Air Quality

Mattoon and Tuscola, Illinois, Sites

#2 According to information in the DEIS, the air emissions from the FutureGen power plant will be extremely minimal during normal operations compared to the existing background concentrations of various pollutants. The power plant's emissions will be well below screening

G2. U.S. Department of the Interior (Chezik, Michael T.)

#2 concentrations developed by the U.S. Environmental Protection Agency (USEPA) for vegetation. While screening concentration data were not provided for animal species, the DEIS indicates that the maximum air emissions when added to the ambient background concentrations are below USEPA's secondary National Ambient Air Quality Standards which are developed to protect against harm to animals. Based on this information, it is unlikely that the air emissions from the proposed facility as a result of both construction and operation will have any significant, adverse impacts to fish and wildlife resources in the project vicinity. The proposed project will require obtaining various air quality permits from the Illinois EPA and/or the USEPA. The U.S. Fish and Wildlife Service (FWS) will provide further technical assistance to those agencies during their review process when requested.

Surface Water

Mattoon, Illinois, Site

#3 The DEIS indicates that no surface water resources occur on the power plant and sequestration site. However, surface water from the site drains primarily into the Kaskaskia River and Lake Shelbyville, and to a minor degree into the Little Wabash River. Additionally, utility construction will cross several tributary creeks that eventually flow into the Embarras River. These river systems are important to fish and wildlife resources in the region and within the state. Additionally, Lake Shelbyville is known to be an important stopover for migrating waterfowl and shorebirds. To minimize impacts to these and other surface waters, we recommend the DOE require stringent stormwater control measures and best management practices to ensure surface water resources, and the species that depend upon them, are protected from harm. Additionally, we recommend that all utility corridor construction utilize directional drilling for stream crossings in order to minimize impacts to water quality. Finally, hydrostatic test water should only be obtained from bodies of water with sufficient volume and flow to supply the required volumes without significantly affecting downstream flow.

Tuscola, Illinois, Site

#4 The DEIS indicates that no surface water resources occur on either the power plant or sequestration sites. Surface water from the power plant site and most of the utility corridors ultimately drain into the Embarras River. Surface water from the sequestration site, the proposed process water line corridor, and the proposed injection line corridor drains into the Kaskaskia River. As noted above, these river systems are important to fish and wildlife resources in the region and within the state. The recommended mitigation measures identified above for the Mattoon Site are also applicable to this location.

Wetlands and Floodplains

Mattoon, Illinois, Site

G2. U.S. Department of the Interior (Chezik, Michael T.)

#5 According to information in the DEIS, up to 29.25 acres of wetlands could be impacted as a result of the proposed project at this site, primarily as a result of utilities construction. These wetlands are primarily identified as forested wetlands. A large forested wetland is located near the sequestration site but not within the Region of Influence for the project; therefore, this area is not anticipated to be impacted. Wetlands serve valuable functions, including providing habitat to numerous species of migratory birds. We recommend impacts to wetland resources be avoided and minimized to the greatest extent practical. A mitigation plan should be developed to fully compensate for any unavoidable wetland impacts. The FWS will provide technical assistance to the U.S. Army Corps of Engineers and the project proponent in development of a plan to fully offset project impacts to wetlands should wetland impacts be unavoidable.

Tuscola, Illinois, Site

#6 The DEIS does not fully identify the maximum amount of wetlands that may be impacted by construction at the Tuscola site. This is because the acreage depends upon future corridor construction. However, the DEIS does indicate that approximately 4.3 acres of wetlands could be impacted, including 2.0 acres of forested wetland. As stated above, wetlands serve valuable functions, including providing habitat to numerous species of migratory birds. Impacts to these resources should be avoided and minimized and a mitigation plan developed to fully offset any unavoidable adverse impacts.

All Sites

#7 Section C.2 of Appendix C of the EIS provides brief descriptions of the Executive Orders with which the FutureGen project must comply, including Executive Order 11990, "Protection of Wetlands." This EO is also mentioned in sections 4.8, 5.8, 6.8, and 7.8, which discuss wetlands and floodplains that may be affected by the construction and operation of the proposed power plant and sequestration site and related corridors for the Mattoon, Tuscola, Jewett, and Odessa sites, respectively. The EO requires federal agencies to avoid short and long term impacts to wetlands if a practical alternative exists. The EO applies to all wetlands, not just those considered jurisdictional under Federal or state statutes. However, the discussions of wetland impacts provided in sections 4.8, 5.8, 6.8, and 7.8 appear to deal almost exclusively with jurisdictional wetlands. We recommend that these sections in the Final EIS be revised to clearly indicate that the EO applies to all wetlands. Each section should also be revised to include discussion of any non-jurisdictional wetlands that could potentially be impacted and whether there are practicable alternatives to avoid such impacts.

Biological Resources

Mattoon and Tuscola, Illinois, Sites

#8 The FWS was initially involved in pre-screening of the sites proposed for consideration in

G2. U.S. Department of the Interior (Chezik, Michael T.)

proposed for the plant site. This pre-screening did not consider the potential impacts associated with utility construction as that information was not provided at that time. Additionally, the information provided in 2006 did not identify that the sequestration site in the Tuscola area would be located some distance from the proposed plant site.

However, as identified in FWS letters dated April 14, 2006, the endangered Indiana bat (*Myotis sodalis*) is the only federally listed species which potentially could occur in the vicinity of either project site (see Appendix A of EIS). While construction at either plant site is not likely to affect this species, the utility construction proposed is likely to impacted forested habitat that may be utilized by this species. The DEIS (page 4.9-6) identifies that construction outside the Indiana bat breeding season would not likely affect the Indiana bat. The breeding season identified in the DEIS is April 1 to September 15. The breeding season (e.g., maternity season) in Illinois is considered to occur from April 1 to September 30. In general, the FWS would concur that tree clearing activities occurring outside of this timeframe are not likely to impact the Indiana bat. Should it be necessary to clear trees during this timeframe, a mist net survey may be required. We recommend contacting the FWS's Marion, Illinois, Ecological Services Office for additional information and guidance prior to initiating any survey activities.

#8 The discussion of Biological Resources did not include any discussion of migratory birds within the project area or Region of Influence for either the Mattoon or Tuscola Sites. While habitat for migratory birds is sparse within the plant sequestration sites, various types of habitats for these species occur within the proposed locations of the utilities (e.g., wetlands, forest, riparian corridors). As such, nesting migratory birds may be impacted as a result of land clearing activities. The Migratory Bird Treaty Act prohibits take of any migratory bird without authorization from the FWS. Birds protected under the Act include all birds with the exception of non-migratory upland game birds (e.g., quail, grouse, pheasant, turkey, etc.) and non-native birds (e.g., European starlings, pigeons, English house sparrows, etc.).

Further, Executive Order (EO) 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," defines the responsibility of federal agencies to protect migratory birds and their habitats. The intent of the EO is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize the take of migratory birds through consideration in land use decisions and collaboration with the FWS. The EO requires federal agencies to ensure that the environmental analyses of their actions evaluate the effects of such actions and agency plans on migratory birds, with emphasis on species of concern.

The Final EIS should include discussion of migratory birds utilizing the area and various measures to be implemented to minimize impacts. We recommend land clearing activities be avoided during the peak nesting season in order to ensure migratory birds are not killed. In the project area, the nesting season would be generally from April 1 to July 31. Some raptor species are known to nest earlier in the year. Surveys for raptor nests are recommended, and this information should be utilized to help determine the construction corridor for utilities.

G2. U.S. Department of the Interior (Chezik, Michael T.)

#8 Some species of migratory birds are further protected by the Bald and Golden Eagle Protection Act and the Endangered Species Act of 1973, as amended. However, bird species protected by these regulations are not known to occur within these two project sites or the Region of Influence associated with the project.

SPECIFIC COMMENTS

Chapter 3: Summary of Environmental Consequences, Section 3.1.9, pages 3-12 and 3-13

#9 1st paragraph: The DEIS states that "Federal and state agencies were contacted to determine the potential for threatened and endangered species to occur within the proposed construction areas at all four sites." It may be worthwhile to include a sentence at the end of this paragraph in the Final EIS informing the reader that copies of the agency letters providing information on threatened and endangered species are included in Appendix A of the EIS.

#10 4th paragraph: The DEIS incorrectly refers to the eastern sand darter as a federally listed species. This species is a state-listed threatened species in Illinois but it is not a Federal endangered, threatened, or candidate species.

#11 2nd, 3rd, 4th, and 5th paragraphs: The Final EIS should provide references and further discussion to support the following statements in these paragraphs:

"There are no unique or rare aquatic or terrestrial habitats present at any of the alternative sites or corridors. Therefore, no direct impacts to these resources are expected." (2nd paragraph)

"...the potential for resident wildlife populations at these sites is low. Therefore, impacts related to the displacement of wildlife communities for these sites would be minimal. The Jewett and Odessa sites provide a greater opportunity for wildlife to be present due to the lack of current intrusive human activities. As a result, resident wildlife populations within the areas to be used by the FutureGen Project would be lost or permanently displaced. Displaced wildlife would likely relocate to similar adjacent habitats that are prevalent in the respective regions of the Jewett and Odessa sites." (3rd paragraph)

"Aquatic habitats and species may be lost through construction; however, this impact would be minimal as none of these features is known to contain any habitat or species that are not plentiful in this area of Texas." (4th paragraph)

"Although considered unlikely, if listed species were to occur within construction areas, they could be directly impacted through temporary loss of habitat or through casualties." (5th paragraph)

Chapter 4- section 4.21 References- 4.4 Geology, page 4.21-3

G2. U.S. Department of the Interior (Chezik, Michael T.)

Bookmarks for the following references have changed and need to be updated in the report:

Illinois State Geological Survey (ISGS), 1995a, Earthquake Occurrence in Illinois. Accessed October 5, 2006 at http://www.isgs.uiuc.edu/earthquakes/Articles/qk-fct-occur.pdf (last
#12 updated November 30, 1999).

ISGS, 1995b, Damaging Earthquakes in Illinois. Accessed October 5, 2006 at http://www.isgs.uiuc.edu/earthquakes/Articles/qk-fct-damag.pdf (last updated November 30, 1999).

Chapter 5-section 5.21 References- 5.4 Geology, page 5.21-3

Bookmarks for the following references have changed and need to be updated in the report:

Illinois State Geological Survey (ISGS), 1968, Geology and Oil Production in the Tuscola Area, Illinois. Illinois State Geological Survey Circular 424. Accessed October 5, 2006 at http://www.isgs.uiuc.edu/oilgas/Circulars/ Cir424_Geology_and_Oil_Production_in_the_Tuscola_Area_Illinois.pdf (last updated January 13, 2005).

#13

ISGS, 1995a, Earthquake Occurrence in Illinois. Accessed October 5, 2006 at http://www.isgs.uiuc.edu/earthquakes/Articles/qk-fct-occur.pdf (last updated November 30, 1999).

ISGS, 1995b, Damaging Earthquakes in Illinois. Accessed October 5, 2006 at http://www.isgs.uiuc.edu/earthquakes/Articles/qk-fct-damag.pdf (last updated November 30, 1999).

Chapter 6-section 6.21 References-6.4 Geology, page 6.21-3

The bookmark for the following reference has changed and needs to be updated in the report:

#14 Illinois State Geological Survey (ISGS), 1995, Damaging Earthquakes in Illinois. Accessed October 5, 2006 at http://www.isgs.uiuc.edu/earthquakes/Articles/qk-fct-damag.pdf (last updated November 30, 1999).

The Department has a continuing interest in working with DOE to ensure that project impacts to resources of concern to the Department are adequately addressed. For matters related to fish and wildlife resources and federally listed threatened and endangered species, please continue to coordinate with the appropriate FWS field office.

G2. U.S. Department of the Interior (Chezik, Michael T.)

Mr. Mark L. McKoy

7

Sincerely,

Michael T. Chezik
Regional Environmental Officer

cc:
L. MacLean, FWS, Fort Snelling, MN
J. Devine, GS, Reston, VA

G2. U.S. Department of the Interior (Chezik, Michael T.)

Response to Comment #1:	DOE will consider whether the proposed project at each of the proposed sites would present such potential environmental impacts or such risks of harm that DOE would not want to fund the project at that particular site. Assuming the FutureGen Alliance selects a host site from among more than one site approved by DOE, it is expected that the Alliance will apply a full range of business considerations, including environmental considerations raised in this EIS, in the site selection process. The Alliance is expected to review this EIS and to use the contents of this EIS, including comments submitted, in their planning and design efforts. DOE will consider whether to impose specific requirements, such as a mitigation plan (in the Record of Decision) for the project.
Response to Comment #2:	Comment noted and will be included in the Administrative Record of the EIS.
Response to Comment #3:	The FutureGen Project would implement best management practices to reduce potential impacts, as expressed in these comments. Also, in the Record of Decision, DOE may require the Alliance to make commitments to complete specific actions (such as mitigation for specific impacts) as a condition to receive government funding.
Response to Comment #4:	The FutureGen Project will implement best management practices to reduce potential impacts, as expressed in these comments. Also, in the Record of Decision, DOE may require the Alliance to make commitments to complete specific actions (such as mitigation for specific impacts) as a condition to receive government funding.
Response to Comment #5:	The FutureGen Project will implement best management practices to reduce potential impacts, as expressed in these comments. Also, in the Record of Decision, DOE may require the Alliance to make commitments to complete specific actions (such as mitigation for specific impacts) as a condition to receive government funding.
Response to Comment #6:	The FutureGen Project will implement best management practices to reduce potential impacts, as expressed in these comments. Also, in the Record of Decision, DOE may require the Alliance to make commitments to complete specific actions (such as mitigation for specific impacts) as a condition to receive government funding.

G2. U.S. Department of the Interior (Chezik, Michael T.)

Response to Comment #7:

Text has been added in Sections 4.8.2.1; 5.8.2.1; 6.8.2.1; and 7.8.2.1 to address Executive Order 11990, which requires federal agencies to avoid short and long term impacts to wetlands (including isolated wetlands) if no practicable alternative exists. Regarding site specific discussions of non-jurisdictional wetlands, the Illinois sites do consider non-jurisdictional wetlands as indicated by the following statements in Sections 4.8.2.1 and 5.8.2.1: "IDNR has the authority to regulate wetlands under the Interagency Wetland Policy Act of 1989 (IWPA) for projects that receive funding or technical assistance from the state. The IWPA defines federal money that passes through a state agency as state funding. Isolated, farmed and U.S. Army Corps of Engineers (USACE) jurisdictional wetlands are state jurisdictional wetlands under the IWPA." The wetland delineations conducted for the Illinois sites included non-jurisdictional wetlands as indicated by the following text in Section 4.8.2.1: "Based on the IDNR site survey and a review of available resources, several wetland areas subject to Section 404 and IWPA jurisdiction exist..."

Regarding the Texas sites, a formal wetland delineation has not been conducted to determine 404 jurisdiction; therefore, the text in Sections 6.8.2.1, and 7.8.2.1 has been revised to eliminate emphasis on jurisdictional wetlands as no official 404 determination has been made. Regarding practicable alternatives to avoid wetland impacts, the reader is referred to the Mitigation and Best Management Practices Section where these measures are discussed. Text has been added in Sections 4.8.3.1; 5.8.3.1; 6.8.3.1; and 7.8.3.1 under Construction Impacts, "Tables 3-13 and 3-14 in Section 3.4 provide potential mitigation measures and best management practices to avoid, minimize, and offset impacts to wetlands."

Additionally, after site selection, non-jurisdictional wetlands will be identified and mapped in Texas if one of the Texas sites is selected. Wetlands in Illinois have already been delineated and mapped as discussed in Sections 4.8.2.1 and 5.8.2.1. Appropriate mitigation and alternatives to avoid such wetlands can be addressed at that time. Development of the EIS has not revealed quantities of non-jurisdictional wetlands that would materially affect the selection of a site for the FutureGen Project or the DOE decision(s) that might be published in a Record of Decision.

G2. U.S. Department of the Interior (Chezik, Michael T.)

Response to Comment #8:

The text has been revised in Section 4.9.3.1 to accurately reflect April 1 to September 30 breeding season for the endangered Indiana Bat.

Text regarding migratory birds has been added to Sections 4.9.2.4; 5.9.2.4; 6.9.2.4; and 7.9.2.4 under "Other Protected Species." For example, for Mattoon the following text has been added, "Coordination with the USFWS and IDNR did not identify any migratory bird populations that could be affected by the project. However, habitat (i.e., wetlands, forests, riparian corridors) for these populations is present. Therefore, a likelihood exists that migratory birds could use habitat within the areas as stopovers during migration".

Discussion of impacts to these populations was also added to Sections 4.9.3.1; 5.9.3.1; 6.9.3.1; and 7.9.3.1. For example, for Mattoon the following text has been added under Utility Corridors, "Construction of the utility corridors could result in temporary impacts to aquatic habitat utilized by migratory birds. Clearing of forests to accommodate utilities would result in a permanent loss of forested terrestrial habitat utilized by migratory birds. This permanent loss of forested habitat would have a minimal effect on migratory bird species as comparable habitat is available in the overall region. If land clearing were to occur during the nesting season, individual bird species could be lost." Regarding timing of land clearing activities, the following has been added to Table 3-14, "Land clearing activities would be avoided during the peak nesting season (April 1 to July 31) in order to avoid impacts to migratory birds. Additionally, surveys for raptors would be conducted if determined necessary."

Response to Comment #9:

Text was revised as follows: "Federal and state agencies were contacted to determine the potential for threatened and endangered species to occur within the proposed construction areas at all four sites (correspondence is provided in Appendix A)."

Response to Comment #10:

Text was revised to read, "…the state listed Eastern sand darter…."

Response to Comment #11:

These statements highlight conclusions made during the analysis of each specific site in Chapters 4 to 7. The following sentences have been clarified and refer the reader to the appropriate section in the document for further reference: "There are no known unique or rare aquatic terrestrial habitats present at any of the alternative sites or corridors. Therefore, no direct impacts to these resources are expected (see Sections 4.9, 5.9, 6.9, 7.9 and Appendix A)." "...the potential for resident wildlife populations at these sites is low (see Sections 4.9 and 5.9)." "The Jewett and Odessa sites provide a greater opportunity for wildlife to be present due to the lack of current intrusive human activities (see Sections 6.9 and 7.9)." "Aquatic habitats and species may be lost through construction....none of these features is known to contain any habitat or species that are not plentiful in this area of Texas (see Section 6.9)." "If listed species were discovered to occur within construction areas...."

Response to Comment #12:

Text was revised for the bookmark for Earthquake Occurrence in Illinois to -- http://www.isgs.uiuc.edu/research/earthquake-hazards/pdf-files/qk-fct-occur.pdf. Text was revised for the bookmark for Damaging Earthquakes in Illinois to -- http://crystal.isgs.uiuc.edu/research/earthquake-hazards/pdf-files/qk-fct-damag.pdf (Both accessed July 18, 2007).

G2. U.S. Department of the Interior (Chezik, Michael T.)

Response to Comment #13:	Text was revised for the bookmark for Geology and Oil Production in the Tuscola Area to -- http://www.isgs.uiuc.edu/sections/oil-gas/Circulars/Cir424_Geology_and_Oil_Production_in_the_Tuscola_Area_Illinois.pdf. Text was revised for the bookmark for Earthquake Occurrence in Illinois to -- http://www.isgs.uiuc.edu/research/earthquake-hazards/pdf-files/qk-fct-occur.pdf Text was revised for bookmark for Damaging Earthquakes in Illinois to -- http://crystal.isgs.uiuc.edu/research/earthquake-hazards/pdf-files/qk-fct-damag.pdf (All accessed July 18, 2007).
Response to Comment #14:	Text was revised for the bookmark for Damaging Earthquakes in Illinois to -- http://crystal.isgs.uiuc.edu/research/earthquake-hazards/pdf-files/qk-fct-damag.pdf (Accessed July 18, 2007).

G3. U.S. Department of Agriculture - Natural Resources Conservation Service (Wickey, Kevin)

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
75 High Street, Room 301
Morgantown, WV 26505
(304) 284-7540 (Phone)
(304) 284-4839 (Fax)

July 10, 2007

Mark L. McKoy
National Energy Technology Laboratory
P. O. Box 880, MS N03
Morgantown, WV 26507-0880

SUBJECT: ECS – Review of Draft Environmental Impact Statement.
NRCS Environmental Document Number 3329.

Dear Mr. McKoy:

The Draft Environmental Impact Statement prepared by the U. S. Department of Energy for the proposed FutureGen Project has been received.

#1 The Natural Resources Conservation Service has no comments at this time. Thank you for the opportunity to review this document.

Sincerely,

William O'Donnell acting

KEVIN WICKEY
State Conservationist

cc: Diane E. Gelburd, Director, Ecological Sciences Division, NRCS, Washington, DC
Ron Wigal, Acting Environmental Specialist, NRCS, Morgantown, WV

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G3. U.S. Department of Agriculture - Natural Resources Conservation Service (Wickey, Kevin)

Response to Comment #1: Comment noted and will be included in the Administrative Record of the EIS.

G4. API (Crookshank, Steven)

Steven Crookshank
Senior Economist
Policy Analysis

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Washington, DC 20005-4070
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July16, 2007

Mark McKoy, Document Manager
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
P.O. Box 880
Morgantown, WV 26507-0880

Re: **"EIS No. 20070213, Draft EIS, DOE, 00, FutureGen Project,** *Federal Register* Vol. 72, No. 105, Friday, June 1, 2007.

To Whom It May Concern:

The American Petroleum Institute (API) appreciates the opportunity to comment on the Department of Energy's (DOE) FutureGen draft Environmental Impact Statement. API is a nationwide, not-for-profit trade association representing nearly 400 member companies engaged in all aspects of the oil and gas industry, including exploration and production, transportation, refining, distribution and marketing. API's member companies are interested in - and in some cases actively pursuing or participating in - carbon capture and storage projects. Given that the final EIS could set precedents for reviews of future projects, API and its members have a strong interest in the DEIS. We offer the following comments on the Draft Environmental Impact Statement (DEIS).

OVERALL COMMENTS

The methodology used in and conclusions resulting from the risk assessment are sound. The methodology described in the Risk Assessment Report effectively and appropriately builds upon the best existing information and state-of-knowledge, uses the best available results from ongoing and recent research, and was subjected to review by a diverse group of qualified experts. The report offers a balanced representation of both the nature of the risks posed and the magnitude of impacts should leaks or other upsets occur, demonstrating that in the "grand scheme," the risks corresponding to CO_2 capture and storage associated with the FutureGen project are small and quite manageable.

#1

However, many aspects of the risk assessment were based on uncertain information or data that are not yet readily available. Because of this, a conservative, cautious approach was taken in the assumptions feeding into the assessment, inevitably leading to estimates of greater impacts/risks than will most likely be the case. Data gathered over the course of the FutureGen project will serve to reduce this uncertainty. Consequently, it will likely be prudent to re-assess some of the risks and impacts as these data become available.

#2

Moreover, since the EIS process under the National Environmental Policy Act (NEPA) requires that all potential impacts and risks be examined, it is somewhat difficult to prioritize risks and impacts in the

G4. API (Crookshank, Steven)

Risk Assessment Report and the EIS. In addition, it can be difficult to evaluate these risks and impacts in an appropriate context. We recommend that greater efforts be deployed to communicate more clearly the most significant risks to be posed by the FutureGen project, along with the characterization of the uncertainties and the continuing need for data as the Project proceeds to reduce these uncertainties. In addition, we recommend that future risk assessments more comprehensively discuss actions to be taken to minimize and mitigate these risks and impacts, and to put these risks and impacts into proper context relative to other fossil fuel-derived energy sources, and, in particular, the risks posed by potential global climate change.

#2

SPECIFIC COMMENTS

Our specific comments focus more on context and perspective, rather than the methodology and/or conclusions of the risk assessment and EIS. Our specific comments address actions and revisions that would further clarify and put into context the various risks associated with the FutureGen project. As such, we recommend including in the report, at a minimum, a qualitative discussion of how the various risks associated with CO_2 capture and storage compare with each other, and how these risks compare with those from alternative methods for power generation. Moreover, and importantly, the risks associated with the FutureGen project need to be compared to the risks and impacts of global climate change -- the larger risk that the FutureGen project is intended to address.

#3

Moreover, this context must include a clear characterization of the actions to be taken to minimize risks, and to mitigate impacts if necessary. This context will be critical in providing the public with accurate, transparent, and understandable information associated with the risks associated with the FutureGen project and the technologies and processes to be considered as part of the project.

#4

Our comments are summarized in the paragraphs below.

Most significant conclusion: The largest risks are associated with upsets and/or malfunctions of surface equipment, not leakage of sequestered CO_2 from subsurface formations. By far the largest risks identified in the EIS and the Risk Assessment Report are those associated with accidental releases resulting from pipeline ruptures or punctures and injection wellhead leaks, not slow leaks from the subsurface of sequestered gases through wells, faults, or caprock. In other words, the largest risks are related to surface facility operations prior to injection. These are characteristic of risks common to normal industrial operations, such as gas processing plants, that are routinely monitored, managed, minimized, and mitigated. Moreover, it is important to note that the likelihood of a pipeline rupture happening was characterized, depending on location, as either "unlikely" (one occurrence in 100 to 10,000 years) or "extremely unlikely" (one occurrence in 10,000 to 1 million years). Similarly, the likelihood of a puncture happening was characterized, again depending on location, as either "likely" ($\geq$1 occurrence in 100 years) or "extremely unlikely" (one or more occurrences in 10,000 to 1 million years).

#5

In addition, an important set of analog data presented in the Risk Assessment Report (Section 5.2) shows that the CO_2 flux from natural accumulation and industrial operations (CO_2 EOR) are all: (1) within the range of natural soil respiration of CO_2 from plant decay and other near-surface phenomena; and, (2) up to three orders of magnitude lower than CO_2 releases from natural volcanic, hydrothermal and metamorphic settings.

Another significant conclusion: The largest risks are associated with exposure to H_2S, not CO_2. Another important conclusion of the Risk Assessment Report is that the largest risks to human health are associated with exposure to H_2S, not CO_2. Again, these risks relate to releases from pipeline ruptures or punctures, from wellhead failure, or from catastrophic accidents primarily related to terrorism or sabotage (which cannot be predicted). (See Table S-12 in the Summary of the EIS.) None of the sites had irreversible or life-threatening effects associated with CO_2.

#6

G4. API (Crookshank, Steven)

Moreover, it is useful to note that the post-injection, subsurface impact of CO_2/H_2S leakage would diminish once the injected gas is in the reservoir, due to H_2S, mineral, and solubility interactions.

Also, it is important to note that these risks were based on the maximum allowable H_2S concentration (100 ppm), not necessarily what will actually be the concentration in the gas stream to be sequestered. This 100 ppm limit is normally defined as the maximum concentration allowed in CO_2 gas streams input into CO_2 pipelines.

Finally, although potential health effects noted due to H_2S exposure are noted, they are generally minimal (except for catastrophic accidents, primarily related to terrorism or sabotage), relating to mild, transient health effects. Life threatening effects of H_2S exposure are generally associated with
#6 exposures over long periods of time, which were not the impacts of concern here. Finally, exposure to H_2S can be easily detected, and thus managed and avoided.

Based on the fact that the largest risks are associated with H_2S exposure resulting from releases from surface facilities, on p. S-58 of the Summary of the EIS it is noted that:

> "Given the results of these screening level assessments, the Alliance would undertake design modifications and employ engineering controls to reduce potential risk and associated consequences…"

Based on this conclusion, it may be useful to reassess these risks and update their characterization after the implementation of such design modifications and engineering controls, and make these results public as they become available.

One result of the FutureGen project is reduction of uncertainties associated with such CO_2 capture and storage. Under the National Environmental Policy Act (NEPA), federal agencies must disclose, as part of preparing an EIS, incomplete, unavailable, or uncertain information used in the EIS preparation process. Therefore, in this EIS, much attention was appropriately given to the uncertainties associated with this "first-of-a-kind" project. These uncertainties were characterized in Section 6.3 in the Risk Assessment Report, and in Section S.8.1 in the Summary of the EIS. Given these uncertainties, in many cases, ranges of possible impacts were determined, with particular emphasis on the
#7 consideration of upper bounds for estimating potential impacts. This will inevitably lead to estimates of greater impacts/risks than will most likely be the case.

Therefore, it is important to note that the FutureGen project itself, at least in part, is intended to acquire and disseminate information to reduce many of these uncertainties. This point should be emphasized more in the EIS. Moreover, over the course of the more detailed site characterizations and project design stages, we recommend that certain impacts be reassessed, and presented to the public, based on the more up-to-date information acquired during the course of the project.

Risks of the FutureGen project should be compared to risks from global climate change and to other energy supply alternatives. While, as documented in the Risk Assessment Report and the EIS, the FutureGen project poses some, albeit small, risks, the purpose of the project is, in fact, to address the problem of global climate change, a significantly larger environmental risk. Moreover, the
#8 technologies to be demonstrated as part of the FutureGen project will, collectively, result in environmental impacts that are substantially less than most other fossil fuel alternatives. This context should not be lost, and appropriately be noted, in the overall EIS. Although such comparison will necessarily be qualitative because the FutureGen project is one project in the context of global climate change, this context is important to illustrate the benefits of such technologies in the longer term to reduce CO_2 emissions to the atmosphere.

More attention should be given to the various actions likely to be pursued to ensure risks are minimized or mitigated. The Risk Assessment Report and the EIS concludes that the inherent risks
#9 associated with storing CO_2 in rigorously selected geological formations will be minimal, and that the greatest risks are associated with surface equipment operations where risks can be minimized with

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appropriate engineering designs, attentive operations, and where impacts can be mitigated if leakage does occur.

A series of actions are central to preventing and correcting sustained leakage of CO_2 from geological formations, namely - - rigorous site selection, assured well integrity, long-term modeling of the CO_2 plume, monitoring of the injected CO_2 (including early identification of leakage), and prompt remediation actions should significant CO_2 leakage occur. These actions, appropriately pursued, can substantially reduce the risks associated with CO_2 capture and storage projects. Moreover, and perhaps most importantly, the largest impacts identified in the EIS can, in most cases, be easily and quickly mitigated.

This point needs to be made as part of the EIS, and, importantly, in communicating the results to various stakeholders and the general public.

#10 **The methodology used in the Risk Assessment Report should be better documented.** Increased emphasis should be given to documenting the methodology (protocol) used for conducting the risk assessment. The Risk Assessment Report notes that the methodology followed is similar to the approach used by Australia's CO2CRC. API's understands that Australia's CO2CRC employed the URS RISQUE approach, which was developed for civil engineering projects (particularly for assessing the risks of dams). It would be valuable to document how the risk assessment methodology has been modified for the FutureGen assessment.

We appreciate the opportunity to comment on this draft Environmental Impact Statement. If you have any questions or need additional information, please contact me at 202-682-8542.

Sincerely,

Steven L Crookshank

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G4. API (Crookshank, Steven)

Response to Comment #1:

DOE expects the data and lessons-learned from the sequestration part of the project, especially from the monitoring of the sequestration, will be subjected to extensive review and analysis, with reports being made available to the public. As a research and development project, risks and potential impacts are expected to be reviewed and reassessed, if appropriate, as the project progresses.

Response to Comment #2:

DOE believes that this EIS does communicate clearly the most significant risks that could be posed by the FutureGen Project, as well as the assumptions and uncertainties involved in the assessment of risks. Furthermore, DOE has made available the Risk Assessment Report upon which the risks presented in the EIS are based. DOE believes that this EIS and the Risk Assessment Report provide the facts to enable the reader to understand the risks and potential impacts in context. DOE has evaluated the most reasonable risk scenarios associated with the Project and has presented these results both in the body of the EIS and also in a more distilled manner within the EIS Summary, Section S.9 (Environmental Consequences), which highlights potential risk areas. DOE believes that the presentation of risks and potential impacts allows both the public and decision-makers to understand the hazards of the project. DOE decision-makers may further consider in the Record of Decision and at subsequent decision points the methods by which risks and impacts could be reduced or mitigated.

The purpose and need for this project is to establish the technical and economic feasibility of co-producing electricity and H_2 from coal, while capturing and sequestering the CO_2 and greatly reducing the emissions of pollutants generated in the process. This purpose and need is entirely consistent with the President's Hydrogen Fuel Initiative and National Climate Change Technology Initiative, and the National Energy Policy (see Section 1.3). Therefore, comparison of FutureGen Project risks with those from alternate methods of power generation (e.g., wind turbines, solar panel arrays, wave power, tidal flow power, etc.) is outside the scope of this EIS. As a research and development platform, FutureGen aims to foster technology improvements at future coal-fueled power plants over the next decade that would reduce pollutants and GHG emissions over the longer term.

DOE recognizes the importance of climate change and intends that FutureGen will demonstrate capture and sequester the greenhouse gas CO_2 as stated in this EIS (see page 1-1). Furthermore, DOE recognizes that, as recently set forth in the report of the Intergovernmental Panel on Climate Change (IPCC, 2007), the issue of climate change is large and complex. There is no need for this EIS to restate the IPCC's analyses or restate their conclusions and recommendations. DOE does believe that the risks associated with the capture and geologic sequestration of CO_2 are less than the risks associated with unabated, ever increasing emissions of greenhouse gases and the consequent impacts. For more information on the risks posed by potential global climate change, please see the reports of the IPCC listed in the Reference section of the Final EIS. FutureGen's contributions to emissions of CO_2, in the context of global climate change, are discussed in newly added text in Section 3.3.1.2.

G4. API (Crookshank, Steven)

Response to Comment #3:

DOE believes that this EIS comprehensively presents the risks associated with possible release scenarios for both pre-injection and post-injection operations, based on conceptual plant design. A qualitative discussion of how risks associated with CO_2 capture and storage compare with each other is presented in the Summary, Section S.9 (Environmental Consequences), which highlights the potential impacts and risks. Comparison of these risks with those from alternative methods of power generation is beyond the scope of this EIS. Furthermore, it is beyond the scope of this EIS to compare the risks associated with the FutureGen Project with the risks and potential impacts of global climate change for the reasons stated in the Response to Comment #2. In general, given the preliminary and somewhat unsettled nature of the predictions regarding global climate change, DOE is not prepared to compare, in a programmatic sense, the potential risks and impacts (both good and bad) associated with CO_2 capture and geologic sequestration versus global climate change. DOE does believe that the risks associated with geologic sequestration of CO_2 are less than the risks associated with unabated, ever increasing, emissions of greenhouse gases from the combustion of fossil fuels, both in the U.S. and world-wide. DOE further believes that widespread and intense public interest in these subjects will drive such assessments and comparisons when data become available from projects like FutureGen.

Response to Comment #4:

DOE expects the project as a whole to help establish the nature of the risks, effective monitoring and mitigation strategies, and cost effective engineering approaches to CO_2 capture from power plants and to geologic sequestration. Furthermore, DOE expects that the site selection effort, planning, engineering, construction practices, operational practices, and monitoring efforts would minimize health and safety risks to the public. Mitigation action plans for various contingencies would be developed based on the detailed site characterization data and the site-specific design work.

Response to Comment #5:

DOE agrees with the comment which reflects a major conclusion in the EIS.

Response to Comment #6:

The findings of the risk assessment for the project are that H_2S and SO_2 gases that could be released from various types of events and accidents would likely create greater risks of harm than releases of CO_2. Following site selection, the Alliance would complete a detailed site characterization and preliminary designs for all the facilities. DOE would then reassess, as needed, the risks and potential impacts of the proposed project to determine whether they (as perceived at that point in time) would fall within the ranges of impacts expressed in this EIS. The resulting Supplement Analysis would be made available to the public, along with a determination of whether a Supplemental EIS would be required.

G4. API (Crookshank, Steven)

Response to Comment #7:

DOE agrees with the idea that the Project would help to reduce uncertainties with CO_2 capture and geologic sequestration by providing an opportunity to gather data and to distribute it to the public. DOE further agrees that the current approach of providing upper bounds for estimating impacts does result in greater impacts/risks than would most likely be the case but has done so in an effort to be conservative and account for design and data uncertainties (discussed in Section 3.2). As stated in previous responses, DOE would reassess potential impacts as more information becomes available during the next phase of the project, and the results would be made available to the public. .

Response to Comment #8:

See response to comment G4-2 and G4-3. Along with considering technical feasibility and compliance with the Project's purpose and need, DOE did consider and compare the potential environmental impacts of potential alternative technologies for electric power generation and for CO_2 sequestration, as briefly reported in Section 2.4.7 for alternative technologies dismissed from further consideration.

FutureGen, as a single project, would not emit sufficient CO_2, nor sequester sufficient CO_2, to significantly affect global climate change. FutureGen's relevance to global climate change rests in its significance as a widely deployable prototype of an integrated system of electric power and hydrogen gas generation from fossil fuels with CO_2 capture and permanent CO_2 sequestration. It would provide the design basis, cost basis, and risk information that would enable the electric power industry to begin substantial reductions (more than 85 percent for new power plants) in CO_2 emissions per unit of electricity or hydrogen gas produced. Qualitative discussion of the desire for widespread deployment of this technology, leading to substantial reductions in CO_2 emissions from fossil-fueled power plants, has been added under Cumulative Impacts in Sections 3.3.1.2 and 3.3.1.3. See also the Purpose and Need for Agency Action and the description of the Project provided in Sections 1.3 and 1.4 for brief statements of the intended benefits of the Project. A substantive analysis of the potential reductions in CO_2 emissions from coal-fueled power plants would require a number of speculative fundamental assumptions, some of which may or may not occur in the future, especially regarding the timing assumed for events. Rather than engage in unfounded conjecture, DOE believes that it is sufficient to say that deployment of FutureGen-related technologies could reduce CO_2 emissions by at least 85 percent (potentially by more than 90 percent) at new fossil-fueled power plants.

Response to Comment #9:

For the Project as a whole, mitigation measures are discussed in Section S.11, Table S-16; and Section 3.4, Table 3-13; and best management practices in Table 3-14. Additionally, during development and drafting of the Record of Decision, DOE would again consider various actions that either must or should be pursued to help ensure risks are minimized or mitigated. DOE would decide whether a mitigation action plan would be required for this project.

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Response to Comment #10:

DOE believes that the Risk Assessment methodology is explained in sufficient detail in the Risk Assessment Report, which was provided on a CD with the EIS and Appendix D, Risk Assessment Methodology of this EIS. In addition to the discussion of both the pre- and post-sequestration approaches in Sections 4 and 5 of the Risk Assessment Report, the report has a series of detailed appendices that describe the methods used in the modeling analyses of pipeline and wellhead releases and the analog database. The part of the FutureGen Risk Assessment that was similar to the Australian sites was the estimation of leakage rates from wells based on industry experience and natural analogs. The actual rates used in the Australian risk assessment for leaks from the CO_2 reservoir at Latrobe Valley were based on reservoir modeling and experience of a panel of experts (Hooper et al, 2005). The Latrobe Valley CO_2 Storage Assessment Report said on Page 76 that the URS RISQUE approach would be used for the other key performance indicators, but not for risk events that relate to CO_2 containment. The application of the RISQUE approach to the four conceptual GEODISCTM storage sites was described in Bowden and Rigg, 2004. The Risk Assessment Report will not be revised in response to this comment.

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July 16th, 2007

Comments on FutureGen Project Draft Environmental Impact Statement (DOE/EIS-0394D)

Dear Mr. McKoy:

Thank you for the opportunity to comment on the FutureGen Project Draft Environmental Impact Statement (DEIS). FutureGen is a highly visible project that will continue to attract public and scientific attention. With this in mind, we submit the following comments in order to encourage the Department to clarify issues that we consider crucial.

Modeling of CO_2 plume

Throughout the DEIS, estimates for the CO_2 plume radius are provided for all four sites. It is assumed that the plume will be symmetrical: any heterogeneity in the injection formations has been ignored. While this may be a reasonable approximation for some sites, heterogeneity is extremely common and could give rise to a significantly different plume shape and dimensions.

#1 Although significant refinement of the plume models is not possible without extensive site characterization, we are aware that more detailed simulations that take into account heterogeneity to the extent possible have already been performed as part of the sites' bids.

We request that the assumptions and results of these simulations be included in a Supplemental Environmental Impact Statement in order to enable a more accurate projection of the extent of the CO_2 plumes at the four sites.

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Site characterization and selection process

The DEIS explains that detailed site characterization will be carried out once an injection site is chosen, which might include the drilling of test wells and conducting seismic surveys. As such, detailed information on the candidate reservoirs is missing from the DEIS. We recognize that it might not be feasible under a limited budget, or the proposed timetable, to perform site characterization at a detailed level for all four sites. However, we stress that one of the key elements of the FutureGen project is further to confirm the feasibility of injecting large amounts of CO_2 into deep saline geologic formations at a sustained rate for several consecutive years. The most important step in that respect is to choose an excellent site, with suitable capacity, injectivity and effectiveness of seal. We are fully aware that the generic geologic characteristics of all four sites currently under consideration make it likely that any of them are conducive to a sound injection project, but also recognize more information is needed in order to rule out the possibility that site-specific features might render one or more sites clearly inferior or even inadequate.

#2 **We therefore request that a Supplemental Environmental Impact Statement describe in detail:**

- **The scope and specifications of the site characterization work that will be undertaken, including the methods to be used;**
- **The complete list of criteria that will be used to select a qualified party to carry out the site characterization work;**
- **The benchmarks, thresholds, methodology and other relevant quantities/methods that will be used to assess whether the results of the site characterization work support or deter the injection of the CO_2 from the FutureGen project; and**
- **The exact procedure (decision tree) according to which the Alliance and/or the Department of Energy (DOE) might revisit the selection of an injection site should the results of the site characterization work indicate that it might not be suitable.**

We urge DOE and the Alliance to clarify that that the FutureGen site selection is only being made on a tentative basis until adequate site characterization has been completed and confirmed the suitability of the site.

NOx Emissions and Selective Catalytic Reduction (SCR) technology

FutureGen is being touted as a "near-zero" emissions facility and the "cleanest" coal-based power generation plant ever built.

#3

The DEIS discusses a NOx target of 0.05 pounds per mmbtu. We do not believe this is appropriate, as it seems to imply that SCR will not be used. Given the degree of sulfur removal planned for the FutureGen project, it should be feasible to deploy SCR. According to the literature, SCR is technically and economically feasible when syngas has a sulfur concentration

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of no more than 5 to 12 ppmv[1]. The literature further suggests that IGCC using SCR can meet NOx emission targets of between 0.01 and 0.02 pounds per mmbtu. In fact, five IGCC plants (some of which have been cancelled for unrelated reasons) have been proposed in the U.S. to date that would deploy SCR and meet an annual NOx emissions standard of 0.02 pounds per mmbtu or less.

#3 **We request that a Supplemental EIS discuss a set of NOx targets also based on the assumption that SCR will be used in the project. Both annual and 30-day targets should be developed.**

We recognize that it might be necessary for targets to be higher in the early years of operation than in the later years due to changes in the number of annual restarts. We also recognize that allowances need to be made to reflect the fact that this is a research project rather than a normal commercial operation. Nonetheless, the targets can and should be substantially below 0.05 pounds per mmbtu. We strongly suggest that DOE and the Alliance commit to the use of SCR technology and revise the project's NOx emissions targets accordingly.

CO_2 Capture Rate

The Draft EIS states that by 2016 FutureGen will be capturing 90% or more of the CO_2 that would otherwise be emitted from the plant. We believe this is a worthy target. The Draft EIS is not as clear, however, regarding what the capture rate will be in the early years of operation. Would 1.1 million tons per year (the quantity quoted as the minimum capture amount) constitute
#4 a 90% capture rate as well, or will the project capture at a lower rate initially and ramp up over time? We encourage DOE to discuss this in a Supplemental EIS and to express annual CO_2 capture targets in terms of:

- Pounds per MWh;
- The percentage of CO_2 captured; and
- The total number of tons to be captured.

Mercury Emissions

The Draft EIS indicates that mercury emissions will be no more than 0.011 tons per year in the first year and 0.0036 tons per year by 2016. We are unsure how these figures relate to
#5 FutureGen's stated mercury removal target of "greater than 90%." What is the actual removal rate implied by these quantities? We request that the Supplemental EIS discuss this question and examine whether or not the project's target for percentage removal should be higher than 90%. The discussion should include the option of 99% removal, which the literature suggests is feasible for IGCC using dual carbon beds[2].

#3 [1] "Technical Issues with SCR in IGCC Applications". Dave Heaven and Brian DeSousa, Fluor, , IChemE European Gasification Conference, May 12, 2004.

#5 [2] "The Cost of Mercury Removal in an IGCC Plant". Parsons Infrastructure and Technology Group Inc., September 2002.

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We appreciate your consideration of these comments and look forward to your response.

Respectfully submitted,

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Response to Comment #1:

DOE and the Alliance are not aware of other publicly available and materially different detailed simulations that take into account reservoir heterogeneity based on real data. Modeling to predict the size of the projected CO_2 plumes at each site was conducted by the Alliance; this modeling considered vertical heterogeneity through appropriate stratigraphic assignment of physical and chemical properties in the geological model for each site. Results of the modeling are included in the EIS in Table S-1; Table S-2; Table S-3; Table S-4; Section S 7.2.1; Table 2-1; Table 2-2; Table 2-3; Table 2-4; Section 2.5.2.1; Table 4.1-1; Section 4.4.3.2; Section 4.4.3.3; Section 4.6.3.2; Table 5.1-1; Section 5.4.3.2; Section 5.4.3.3; Section 5.6.3.2; 3; Table 6.1-1; Section 6.4.3.2; Section 6.4.3.3; Table 7.1-1; 7.4-10; Section 7.4.3.2; and Section 7.4.3.3. DOE is aware of the importance of considering horizontal heterogeneity and anisotropy in the reservoir. Following site selection, the Alliance will perform reservoir simulations that include or account for lateral heterogeneity and/or anisotropy. These simulations will use information from additional site-specific geologic characterization (including the drilling of one or more exploratory wells, performing well tests, and conducting additional seismic surveys) completed during the detailed site characterization phase.

On September 20, 2007, DOE sought from the authors of the comment letter their knowledge about more detailed reservoir simulations that had been prepared as part of the site offeror's bids. The conclusion of both the comment's authors and the DOE was that, although some simulations had apparently been performed by the site offerors in Texas, the results of these simulations had not been made available to the public and had not been given to either the commentors, the Alliance, or DOE. DOE will review and consider the results of such simulations when this information becomes available.

CEQ regulations implementing the procedural provisions of NEPA state that an agency must prepare a supplement to a Draft or Final EIS if (1) the agency makes substantial changes in the Proposed Action that are relevant to environmental concerns, or (2) there are significant new circumstances or information relevant to environmental concerns and that have bearing on the Proposed Action or its impacts. DOE has not made any substantial changes to the Proposed Action and no new significant information has become available since the issuance of the Draft EIS. Thus, there is no reason to prepare a Supplemental Draft EIS at this time. However, following site selection and additional site-specific characterization, DOE has committed to preparing a Supplement Analysis to determine if the Final EIS should be supplemented (see 10 CFR 1021.314). If as a result of the Supplement Analysis, DOE determines that there are substantial changes or significant new circumstances or information that are relevant to the Proposed Action and impacts, then DOE would prepare a Supplemental EIS.

Response to Comment #2:

Discussions of future NEPA activities are in the EIS in Sections S.1.3; 1.6.3; and 2.6.1.3. The four reasonable alternative sites were selected after a thorough screening process by the Alliance and DOE, including a review by a panel of experts in geologic sequestration. The sites are considered good candidates for sequestration based on their suitable geology (including the presence of seals or confining layers), which is well understood and documented for each site on a regional basis. However, a detailed characterization (that includes exploratory drilling) of all four alternative sequestration sites would be exorbitantly expensive and time consuming and would not necessarily provide information

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"essential to a reasoned choice among alternatives" for the purposes of this EIS (40 CFR 1502.22a). A "reasoned" choice does not have to be based on ideal availability of information. The current information is sufficient to support the decisions that should be made in the Record of Decision. And, given the possibility of the Alliance changing their selection if their first choice proved inadequate, it is not "essential" at this point in the process for either DOE or the Alliance to pursue detailed site characterization at all four sites. For example, if a significant leakage pathway could be uncovered now at one of the alternative sites while exploring all four sites, it would also be uncovered later during the detailed site characterization phase, if that site is selected – and the cost of the selection process would have been much less.

Therefore, after selection of the host site, the Alliance would conduct additional site-specific characterization work on the chosen site and would develop a site-specific plant design for the FutureGen Project. Both the additional site information and the site-specific design work would be reviewed by DOE and would support the completion of a Supplement Analysis. Based on the results of the Supplement Analysis, DOE would determine if there were substantial changes in the Proposed Action or significant new circumstances or information relevant to environmental concerns, as discussed in 40 CFR 1502.9(c). If the results of the characterization studies reveal that the chosen site is not acceptable, the Alliance (and, if necessary, DOE) would revisit the list of approved sites and select the next best site for a restart of the characterization phase. Both DOE and the Alliance are aware of this possibility.

A brief discussion of the additional detailed site characterization activities that would be conducted at the selected site is provided in Sections S.8.1.2 and 2.6.1.2. More detailed planning, including items such as those recommended by the Commentor would need to be completed before a Supplement Analysis and a Supplemental EIS would start, so these items would be more appropriate for inclusion in a planning document or in statements of work for the detailed characterization phase. Generally, planning documents (e.g., including any decision tree(s) produced) held by DOE can be provided to the public. Additionally, statements of work that include or incorporate plans could be released to the public (excluding sensitive information, such as patentable matter, financial information, etc.) as part of the solicitation process. The recommendations in these comments will be reviewed and considered when plans are completed for the detailed site characterization phase.

Since the publication of the FutureGen Project Draft EIS, there have been no substantial changes to the Proposed Action and there are no significant new circumstances or information available at this time that would require the production of a supplement to the Draft EIS.

DOE believes that if the electric power generation industry is to adopt carbon capture and geologic sequestration as a means to reduce greenhouse gas emissions, the industry must be able to identify sequestration reservoirs at reasonable costs and within reasonable time periods. The FutureGen Project's approach of evaluating several candidate sites using readily available data and then selecting a site for more detailed investigation is a process that would most likely be employed by the energy sector in the future for similar projects. DOE agrees that if the detailed investigations uncover a problem with the primary and secondary storage reservoirs at a site, then the next best site could be selected and the same investigations would be conducted at that site. The process would continue until an acceptable site (or reservoir) is found. At least

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one exploratory well would be drilled and tested to confirm the storage potential of each selected host site.

Response to Comment #3:

A research and development target of the FutureGen Project is to demonstrate the ability to achieve emissions of less than 0.05 lb/MMBtu nitrogen oxides (NOx), as stated in the report to Congress: FutureGen: Integrated Hydrogen Electric Power Production and Carbon Research Initiative (DOE, 2004). For the purpose of the EIS, the emissions envelope was developed based on achieving the stated goal, emitting NOx at a rate slightly below 0.05 lb/MMBtu, equivalent to approximately 15 parts per million volumetric, dry basis (ppmvd) @ 15 percent O_2 dilution. Achieving NOx emissions rates substantially below 0.05 lb/MMBtu would result in a marked decrease in NOx emissions and would result in lower potential impacts. Therefore, evaluating emissions at the upper end of the expected envelope results in a conservative (high) estimate of impact to ambient air quality for purposes of NEPA analysis. FutureGen would employ a utility size combustion turbine firing hydrogen as its primary fuel. Because nearly all fuel-bound nitrogen is removed in the gas cleaning and conditioning units upstream of the turbine, any NO_x formation would be a result of thermal NOx formation resulting from oxidation of nitrogen in compressed air delivered to the combustion chamber of the turbine.

Combustion of hydrogen results in appreciably greater firing temperatures than would result from the combustion of syngas consisting of primarily H_2 and CO. There are no commercially available hydrogen-fired turbines of a size suitable for FutureGen. While there is a considerable knowledge base of the NOx formation and control for natural gas and syngas-fired turbines, there is not sufficient knowledge to fully understand the same for hydrogen-fired turbines. DOE currently has a significant turbine development program focused on achieving low NOx emissions from hydrogen-fired turbines. Two goals of the program directly linked to FutureGen are (1) by 2010 – reduce NOx emissions to 2 ppm in the turbine exhaust at 15 percent oxygen when firing syngas and (2) by 2012 – develop emissions control technology capable of reducing NOx emissions to near-zero for hydrogen-fired turbines. Selective Catalytic Reduction (SCR) is a well proven technology for reducing NOx emissions from combustion turbines fired using natural gas. There is limited performance data for SCR from combustion turbines fired using coal-derived syngas.

Many IGCC projects recently proposed have considered SCR, and it is expected that there will be a reasonable amount of data available for syngas-fired turbines when FutureGen goes online in 2012. The conceptual design of FutureGen, as presented in the Initial Conceptual Design Report (ICDR), does in fact consider the application of SCR to achieve NO_X emission levels of approximately 0.02 lb/MMBtu, and at present the design indicates that such levels are likely achievable with satisfactory cost and performance. Design activities are currently underway to evaluate the application of SCR at FutureGen.

- Table S-16 mentions SCR as a possible mitigation measure for NO_X emissions.
- Footnote 3 of Table 2-9 was revised to provide the expected NO_X emissions if SCR is used.
- Sections S.7.5.3 and 2.5.6.4 provide an estimate of the amount of aqueous ammonia that the SCR would use.

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Because FutureGen would be designed to gasify a wide variety of coal types (including some high sulfur coals), the plant would not be optimized to fuel type for either efficiency in energy conversion or pollutant minimization, so the optimal minimization of NO_X emissions may not be achieved. Furthermore, because the plant would be designed to accommodate a variety of R&D applications that may be proposed in the future, the plant components would be integrated loosely such that the power plant as a whole may not perform optimally.

As stated in Response to Comments #s 1 and 2, after site selection and the results of the site-specific characterization, DOE will prepare a Supplement Analysis to determine if (1) there are any substantial changes in the Proposed Action that are relevant to environmental concerns, or (2) there are significant new circumstances or information relevant to environmental concerns that have bearing on the Proposed Action or its impacts. If as a result of the Supplement Analysis, DOE determines that there are substantial changes or significant new circumstances or information that are relevant to the Proposed Action and impacts, then DOE would prepare a Supplemental EIS.

Response to Comment #4:

The FutureGen ICDR considered a number of technologies and conceptual technology integration configurations that could meet the FutureGen performance goals. The emissions envelope developed for the EIS does not represent any single technology configuration, and to build conservative estimates the envelope represents the poorest performance of each configuration. Therefore, the CO_2 emissions and capture rates presented in the EIS are expected to be worse than the performance of the as-built facility.

The 1.1 million tons per year of CO_2 captured is really a goal for the sequestration of CO_2, as stated in the report to Congress (2004). The value is simply a minimum number by which to judge success of geologic sequestration. DOE acknowledges that the FutureGen power plant will likely have very significant non-operating time during the first year, and this will result in less CO_2 captured and sequestered compared to that which could be captured and sequestered if the plant ran full time. DOE also acknowledges that the initial capture rate could be as low as 85 percent, although the engineering design must be for at least 90 percent capture. It is expected that the annual tonnage captured would be higher than 1.1 million tons per year.

The emissions envelope was developed based on the worst case scenarios for coals. As described above, in the first year of operation, it is assumed that the CO_2 capture rate would be 85 percent, so that 15 percent of the CO_2 generated would be emitted into the atmosphere. This equals 114.21 lbs/MWhr to 243.14 lbs/MWhr of CO_2 emitted and 647.2 lbs/MWhr to 1,377.77 lbs/MWhr of CO_2 captured, depending on plant availability (the quantity captured (or emitted) each year (tons per year) would be a function of the amount of time the plant is running each year). For 2016, when the R&D of the project ends, it is assumed 90 percent of the CO_2 would be captured and 10 percent would be emitted into the atmosphere; therefore, from 76.14 lbs/MWhr to 162.09 lbs/MWhr of CO_2 would be emitted depending on plant availability. At a level of 90 percent capture, this results in 685.3 lbs/MWhr to 1,458.9 lb/MWhr captured.

The Alliance may sell excess CO_2 (that CO_2 captured above the 1.1 million tons per year would be sequestered in a saline aquifer) for enhanced oil recovery

G5. Environmental Defense – Natural Resources Defense Council (Anderson, A. Scott and Peridas, George)

purposes which would ultimately result in the permanent sequestration of a significant amount of the excess CO_2.

For additional information, see Section 3.3.1.2 on Project Emissions.

Response to Comment #5:

A goal of the FutureGen Project is to demonstrate the ability to achieve greater than 90 percent removal of mercury (Hg) from syngas. For the purpose of the EIS, the emissions envelope for Hg emissions was based on a minimum design Hg capture of 90 percent of the Hg in the feed coal. Specifically, steady-state emissions were calculated using an average coal Hg content and a heat input rate of 1,754 MMBtu/hr at 70°F. Based on technologies considered for the conceptual design, Hg emissions are expected to meet design specifications during steady-state operations. As with other emissions of interest, upset Hg emissions were based on best engineering judgment and are included in the annual totals for each year of operation.

Achieving Hg removal substantially greater than 90 percent would result in a marked decrease in Hg emissions and would result in lower potential impacts. Therefore, evaluating emissions at the upper end of the expected envelope results in a conservative (high) estimate of impacts due to Hg emissions for purposes of NEPA analysis. Current technologies to remove Hg from syngas are reasonably well understood in industrial applications. For example, Eastman Chemical Company has employed carbon beds for Hg removal from syngas. Information suggests that properly designed carbon beds can remove 90 – 95 percent of the Hg in coal-derived syngas. Commercial experience in removing Hg from natural gas using carbon beds has indicated that removal levels greater than 99.99 percent have been achieved. However, similar levels have not been demonstrated at coal-based IGCC plants.

The goal to achieve greater than 90 percent Hg removal is to demonstrate an attainable level that would facilitate the deployment of high-efficiency Hg control technologies in IGCC power plants. Higher levels of removal, such as 99 percent, present technical challenges such as an undesirable pressure drop caused by the use of multiple carbon beds in series. Furthermore, emerging technologies to capture Hg at higher temperatures provide significant opportunities to increase overall system efficiencies but are currently not as effective as those that operate at lower temperatures such as carbon beds. These technologies would be integral to achieving near-zero emissions power plants and are likely to be tested at FutureGen. FutureGen would be designed to cost-effectively remove Hg with high capture efficiency and could provide a design basis and test platform for Hg control technologies for the next-generation of FutureGen plants.

G6. ConocoPhillips (Elm, Kevin L.)

From: Elm, Kevin [mailto:Kevin.Elm@conocophillips.com]
Sent: Wednesday, July 18, 2007 3:24 PM
To: FutureGen.EIS@netl.doe.gov
Subject: FutureGen EIS

#1 Mr. McKoy - did DOE open an electronic public docket for the FutureGen projects? I have read the EIS, but I am more interested in any public comments, transcripts of meetings, letters of support, etc. that might be in a docket.

Could you please direct me to the appropriate docket? Thanks very much.

Kevin L. Elm, P.E. kevin.elm@conocophillips.com
Global Gas - LNG; ConocoPhillips
600 N Dairy Ashford; Houston, TX 77079
281-293-3217; fax: 281-293-4830

G6. ConocoPhillips (Elm, Kevin L.)

Response to Comment #1:	DOE did not create an electronic public docket. Public comments have been reproduced in this Final EIS, and posted on the DOE website (http://www.netl.doe.gov/technologies/coalpower/futuregen/EIS), and otherwise made available to the public.

G7. Scott, John T.

7-15-2007

Mr. Mark L McKoy
Environmental Manager, U.S. Department of Energy
National Energy Technology Laboratory
P. O. Box 880,
Morantown, WV26507-0880

Re: Future Gen

This is nothing but a boondoggle of the taxpayer's money. The process to change coal into liquid fuels is the same unimproved technology developed by German scientists under the Nazis 75 years ago. It uses too much water, too much coal, and supposedly deposits CO2 in the ground – so far an undeveloped technology. The only place CO2 is found underground is in volcanoes where it always eventually spews forth.

A few coal company owners, like Drummond who is accused of assassinating union organizers in Columbia, are getting rich with tax payer subsidies, while ruining our environment. They are destroying our farmland with long wall
#1 mining so we can no longer grow corn to turn into ethanol or meat for the hungry.

Autos that use only electricity can operate on 1/3rd the cost of gasoline. The money would be better spent on windmills to generate electricity and leave the environment intact or nuclear power which also does little harm to the environment This is what France has done and even Japan to a large degree. We developed nuclear power, but haven't had the good sense to use it. How do you explain that?

Some scientists figured out a way to harness the tides for generation of electricity – like in the bay of Funday – over 50 years ago. What happened to that project?

Sincerely,

John T. Scott BAS

John T. Scott, PhD, MAI

G7. Scott, John T.

Response to Comment #1:

FutureGen would neither use the Fischer-Tropsch process as implied by the Commentor nor produce liquid fuels. It will test and demonstrate the sequestration of CO_2 deep underground (more than 2,400 feet deep) in natural reservoirs. This concept of sequestration of CO_2 appears to offer a useful means of reducing emissions of CO_2 from power plants. The fact that this concept is "undeveloped" is justification for the expenditure of public funds to test and demonstrate it. Carbon dioxide is found in some concentration almost everywhere there is pore space and fracture space underground, even dissolved into underground liquids (both water and oil). Most of it has been there for millions of years, proving that it can stay underground and that it does not cause, except in very rare case, serious impacts to the environment at the land surface.

By funding FutureGen, DOE is not subsidizing the coal industry. Nor is DOE subsidizing the electric-power industry, which could continue building power plants that do not capture and sequester the CO_2 they generate. The FutureGen Project is an example of industry and the U.S. government joining together in a partnership to undertake a project that neither would likely undertake *n*or succeed alone. All resources that can be used to produce electricity also create environmental impacts; therefore, DOE advocates a balanced and judicious usage of all resources along with conservation of resources and improved efficiency on both the production and consumption sides.

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

(Pages S-69 to S-70, Table S-12) and (Pages 3-40 to 3-41, Table 3-3)

IL1-1

Wetlands

Each wetland listed for Mattoon and Tuscola in These tables as well as any other references in the text should have the following reference. *Field verified by wetland delineations conducted August 2006.

(Page S-7, Table 2-1.) and (Page 2-5, Table 2-1.) and (Page 4.1-4, Table 4.1-1) and (Page 4.7-6)

Description of reservoir in process water section.

M21-1

"If a larger reservoir were constructed (approximately 40 acres [16.2 hectares] in size) with a capacity of 200 million gallons (757 million liters), the Mattoon WWTP effluent would be sufficient by itself to supply the proposed plant's process water."

This calculation was based on a minimum process water supply requirement of 3.6MGD. With the increased process water requirement of 4.3MGD, this calculation was redone and resulted in a reservoir size of 310 million gallons and approximately 44 acres. If Charleston WWTP effluent is added, the reservoir may be reduced to 25.5 Acres and 114 million gallons.

(page S-50, Section S.6.5.2)

Air Emissions

#1

"Associated with such unplanned restarts are short-term increases to facility emissions due to the need to flare process gases for a short period, as well as to restart the facility."

Flare releases are not modeled the same as traditional "smokestack" releases. Since "unplanned restarts" result in significant SO2 emissions from the flare, what would be the likely change in modeling results (NAAQS and PSD increment) if flare emissions were truly modeled as a flare following USEPA modeling guidance rather than as the hypothetical HRSG stack emissions?

(Page S-50, Section S.6.5.3)

Toxic and Hazardous Materials

G9-1

"The FutureGen Project would use a variety of process chemicals, primarily for the treatment of process water and maintenance of the cooling towers."

Have the antiscalants, biocides and other chemicals that will be used in the process water, cooling tower water, etc. been evaluated for their potential impact to local biota from cooling water drift air emissions, or any other potential air emission sources?

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

(Page S-63, Table S-12) and (Page 3-5, Section 3.1.3) and (Page 3-34, Table 3-3)

Tornado frequency

O54-1

"The Odessa region has the lowest historical tornado activity, with one tornado greater than F1 intensity occurring every 200 years."

Section 7.3.2.2 of the EIS reports 7 tornadoes of intensity F1 or greater in Ector county in the last 56 years. That is certainly a higher rate than one every 200 years. Was the same methodology used for all four sites to obtain a predicted tornado frequency?

(Page S-68, Table S-12) and (Page 3-39, Table 3-3)

Surface water impacts

M21-2

Cassell and Kickapoo creek flows reduced by process water withdrawals (3,000 gallons per minute [gpm] [11,356 liters per minute (lpm)]) from Mattoon and possibly Charleston wastewater treatment plants.

This statement may imply that process water is being withdrawn from these streams. Reword as follows to avoid this misconception: "Cassell and Kickapoo creek flows reduced by diversion of effluent discharge water from Mattoon and possibly Charleston wastewater treatment plants to provide process water (3000 gallons per minute [gpm][11,356 liters per minute (lpm)]).

(Page S-100, Section S.9.3.1) and (Pages 5.6-2 and 5.6-3, Section 5.6.2.1) and (Section 5.7.2.2) and (Page 5.7-12, Section 5.7.3.2) and (Page 5.9-10, Section 5.9.3.2) and (Section 5.15.22)

Groundwater impacts.

"At Tuscola, under low-flow periods, the Kaskaskia River water that would serve as the plant's process water could be augmented with water drawn from the Mahomet Aquifer."

T32-1

"Lyondell-Equistar Chemicals currently draws its raw water supply from an existing intake structure along the Kaskaskia River, and supplements its water supply during low-flow conditions by pumping water from wells near Bondville, Illinois, which are screened in the Mahomet aquifer. This supplemental water is conveyed to the intake structure at Lyondell-Equistar Chemicals via the Kaskaskia River."

It should be noted that an error was recently discovered in the Kaskaskia River stream gauge at Tuscola. New measurements indicate that water flows in the Kaskaskia River have been significantly larger than previously reported – as much as 2.5 times larger. The Illinois State Water Survey is conducting further measurements to complete a new calibration curve for the stream gauge. As a result, it is anticipated that augmenting the river's flow with water drawn from the Mahomet Aquifer will be required even less frequently than predicted. Ron Expand to show the predicted use and estimated flows.

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

(Page 2-53 and page 2-55 in Section 2.5.22)

Length of project's active injection period.

#2 "In terms of DOE's research program, the total monitoring timeline is 6 years, including the 1-year of baseline data collection, 3 years of active injection, and 2 years of post-injection monitoring."

"Fluid sampling from various monitoring wells would occur twice each year during the 4-year active injection period (research and development phase of the project)."

Is the active injection period 3 years or 4 years?

(Pages 3-1, 3-4, Section 3.1.2)

Air Quality

"Impacts related to visibility, regional haze, and nitrogen and sulfur deposition in Class I areas were also considered. DOE also reviewed the applicability of air regulations and regional air quality plans and the potential for impacts from vapor plumes and odors."

#3 "Because of the size of each proposed site, odors of hydrogen sulfide (H2S) and ammonia are expected to be limited to within the facility boundary. There is the potential for solar loss, fogging, icing, or salt deposition because of the vapor plume from the cooling tower and gas turbine exhaust stack(s). However, because of the size of the proposed properties, impacts related to vapor plumes would be limited to within the facility boundary and would not interfere with quality of life in the area of any of the four sites."

The EIS provides virtually nothing in the way of quantitative estimates of odor impacts (for any averaging time). If odor modeling was performed based upon all sources (flare, fugitives, and stack releases) - rather than a hypothetical single source (HRSG stack) as used for the criteria pollutant modeling - and upon instantaneous impacts (3-5 seconds, the length of time to take a breath of air), would the modeling results support the claim that "odors of hydrogen sulfide (H2S) and ammonia are expected to be limited to within the facility boundary (p. 3-4)?

(Page 3-11, Section 3.8.1)

Construction in floodplains.

#4 "The proposed utility corridors for all four proposed sites would involve construction within the 100 year floodplain."

Floodplains at Illinois sites would be impacted only if optional 345KV transmission corridors and optional water supply pipeline were chosen.

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

(Page 3-11, Section 3.8.1)

Impacted Wetlands

M21-3 "Up to 29.2 acres (11.8 hectares) of wetlands could be impacted along the transmission line and process water corridors."

Since the number of impacted wetlands at Mattoon varies significantly with the choice of transmission corridors and water supply options, we suggest appending, ",depending on the options chosen." to this statement.

(Page 3-11, Section 3.8.1)

Wetlands

"The appropriate type and ratio of wetland mitigation would be determined through the Section 404 permitting process."

M21-4 The following paragraph from Volume II, Page 4.8-1:

> "IDNR has the authority to regulate wetlands under the Interagency Wetland Policy Act of 1989 (IWPA) for projects that receive funding or technical assistance from the state. The IWPA defines federal money that passes through a state agency as state funding. Isolated, farmed, and U.S. Army Corps of Engineers (USACE) jurisdictional wetlands are state jurisdictional wetlands under the IWPA. IDNR accepts the procedures outlined in the 1987 USACE Wetland Delineation Manual for delineating wetlands. The IWPA requires mitigation for all adverse impacts regardless of the size of the impacted area or the wetland quality."

Should be also be inserted after the first full paragraph on Page 3-11 in Volume 1.

(Page 3-13, Section 3.1.9)

Biological Resources

M21-5 "The proposed Mattoon Power Plant and Sequestration Site has potential habitat for the federally-listed Eastern sand darter and the Indiana bat. Habitats for the state-listed Kirtland's snake and the federally-listed Eastern sand darter have been found in the vicinity of the process water supply line corridor.

The list reference for the Eastern Sand Darter is incorrect. It is state-listed not federally-listed. Please correct as follows: "The proposed Mattoon Power Plant and Sequestration Site has potential habitat for the state-listed Eastern Sand Darter and the federally-listed Indiana Bat. Habitats for the state-listed Kirtland's Snake and Eastern Sand Darter have been found in the vicinity of the process water supply line corridor."

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

(Page 3-16, Section 3.11) and (Page 3-24, Section 3.1-15)

Mattoon process water pipeline length

M21-6

"The Mattoon process water pipelines would traverse up to 14.3 miles (23 kilometers)."

The pipeline from the Mattoon WWTP would traverse only 7.5 miles. Adding the optional pipeline to deliver water from the Charleston WWTP would increase this to 14.3 miles. We suggest changing this statement to read, "The Mattoon process water pipelines would traverse 7.5 miles (12 kilometers) or 14.3 miles (23 kilometers) depending on the option chosen."

(Page 3-17, Section 3.1.12), Pages 3-98 and 3-99 (Table 3-13), (Page 4-12.6, section 4.12.3.2) and (Page 5.12-5, Section 5.12.3.2)

Unobstructed views of the powerplant.

"Two residential properties directly adjacent to the proposed power plant site, two residences within 0.25 mile (0.4 kilometer), and approximately 20 residences within a 1-mile (1.6-kilometer) radius of the site would have unobstructed views of the facility."

IL1-2

"Three residences directly adjacent to the site and seven residences within 0.5 mile (0.8 kilometer) of the site would have unobstructed views of the power plant."

The Illinois sites are capable of generating ample available soil (due to reservoir construction) to construct earthen berms, and earthen berms are logical additions to various perimeter locations to screen otherwise unobstructed views of the power plant. Tree planting is also capable of significantly screening the views. For example, for the Mattoon site, depending on the location of the plant, a 16-foot high berm has the potential to screen most of the structures of the power plant from the adjacent residences, and trees will further enhance the screen.

Table 3-14, possible BMPs, does not mention berms as a method to mitigate potential impacts to aesthetics and noise. Berms and vegetation are effective mitigation tools that should be listed in the table.

(Page 3-21, Section 3.1.14)

Noise from train operations.

T32-2

Noise levels for the Tuscola Site during coal unloading would increase by less than 3 dBA at the three closest residential receptors and by up to 12 dBA at 12 other residential receptors within approximately 1 mile (1.6 kilometers) of the site boundary.

The numbers in this statement are reversed. The larger 12dBA increase would be at the closest receptors and the <3dBA increase at the others. Also here and in Sections 4.14 and 5.14, it should be noted that noise impacts at the closest receptors can be mitigated by 5-10 dBA if earthen berms are constructed along the site perimeter. Planting of trees also mitigate noise levels somewhat.

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

(Page 3-29, Section 3.1.17)

Hazards from SO2/H2S releases

#5

"If sulfuric acid can be produced and sold, the need to produce elemented sulfur and, and therefore, the need for the Claus unit and the risks associated with it would be eliminated."

The option of a sulfuric acid plant vs a Claus unit is not discussed elsewhere. The relative risks of producing acid and producing elemental sulfur were not compared in the Risk Assessment Study. Would there be a significantly reduced risk from accidental releases with a sulfuric acid plant since both systems burn H2S to SO2 in their processes? Wouldn't the additional processing steps required to produce sulfuric acid increase risks?

(Page 3-9, Section 3.1.7)

Description of surface water crossings by utility corridors

M21-7

"Construction of the proposed water supply pipeline at the Mattoon Site would cross five surface waters,"

Only two streams or drainage ditches will be crossed by the Mattoon-only water supply line and 138 kV connection options for the Mattoon project. An additional three crossings would be encountered if the Charleston supplemental water supply pipeline was utilized. We suggest changing this statement to read, "Construction of the proposed water supply pipeline at the Mattoon Site would cross two to five surface waters depending on the options chosen."

(Page 3-9, Section 3.1.7)

Description of surface water crossings by utility corridors.:

T32-3

"the proposed CO2 pipeline at the Tuscola Site would cross <u>seven</u> surface waters,"

Section 5.7.3.1 of the draft EIS, page 5.17-11, says," The proposed CO2 pipeline would cross <u>four</u> surface water bodies: one unnamed tributary to the Tuscola No. 4 drainage ditch, and three unnamed tributaries to the Kaskaskia River." Also, the study of wetland areas associated with the Tuscola site conducted by Hey and Associates found that the CO2 pipeline would cross only <u>one</u> wetland as stated in Section 5.8.3.1 on page 5.8-8. These statements are contradictory. We believe one surface water is the correct number.

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

(Page 3-38, Table 3.3)

Tuscola groundwater impacts

Operations:
Process water source; treated wastewater primary source, ultimate source is the Kaskaskia River. Shortterm
impacts from supplemental use of groundwater. Aquifer: Mahomet (supplemental only), Aquifer capacity: 16 to17 million gallons per day (61 to 64 million liters per day)

T32-4

The primary source is an industrial reservoir filled with water from the Kaskaskia River. While the river flow may include quantities of treated waste water and some treated waste water may be returned to the reservoir, the river is the main water source.

Also, the aquifer capacity, stated for the Tuscola site as 16 to 17 million gallons per day (MGD), is too low to be the yield for the entire Mahomet aquifer. The potential yield from the Mahomet and overlying aquifers was estimated to be 445 MGD (Visocky and Schicht, 1969). The 16 to 17 MGD figure may be the total pumping capacity of the wellfield used by the Tuscola chemical company that pumps groundwater from the Mahomet aquifer and discharges to the Kaskaskia River. A well capacity of 12,000 gallons/min converts to 16+ MGD.

(Page 3-39, Table 3.3)

Mattoon surface water impacts

Operations:
Streams affected: Cassell and Kickapoo creek flows reduced by process water withdrawals (3,000 gallons per minute [gpm] [11,356 liters per minute (lpm)]) from Mattoon and possibly Charleston wastewater treatment plants.

M21-8

For the Mattoon site, the proposed FutureGen plant will use wastewater that Mattoon discharges to Kickapoo Creek and that Charleston discharges to Cassell Creek. Cassell Creek flows into the Kickapoo Creek, which flows into the Embarras River downstream of Lake Charleston. The FutureGen plant requires 3,000 gpm of wastewater, which represents 62% of the average effluent discharged from both wastewater treatment plants. This water will be impounded in a reservoir to be built at the Mattoon site. This reservoir should provide flexibility to mitigate any problems associated with low flows in Cassell and Kickapoo Creeks. In addition, the IDNR has provided its opinion that diverting these effluents would positively impact these streams, allowing them to return to a more natural state.

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

(Page 3-59, Table 3-3) and (Risk Assessment Study, Pages 5-24, 6-17 and 6-18)

Upward migration through wells.

Proposed Action – Human Health, Safety, and Accidents (continued)

Mattoon	Tuscola	Jewett	Odessa
Number of individuals potentially impacted by slow upward leakage of H2S from other existing wells (risk rated as extremely unlikely): Adverse effect: 1	Number of individuals potentially impacted by slow upward leakage of H2S from other existing wells (risk rated as extremely unlikely): Adverse effect: 6	Number of individuals potentially impacted by slow upward leakage of H2S from other existing wells (risk rated as extremely unlikely): Adverse effect: 0.4-26	Number of individuals potentially impacted by slow upward leakage of H2S from other existing wells (risk rated as extremely unlikely): Adverse effect: 0.3

#6

If, as stated in the Risk Assessment, the leakage risk is proportional to the # of wells, how are the adverse effects greater at Mattoon and Tuscola? Jewett and Odessa have up to 57 and 16 wells respectively penetrating the caprock, while the Illinois sites have none. Pages 6-17 and 6-18 show a probability of failure for the Illinois sites as zero which would imply a zero adverse effect.

(Page 3-66, Section 3.2.3.3)

Description of Mt. Simon Formation

"The thickness of the Mt. Simon formation is considerably uncertain because the formation was deposited on an eroded, high-relief surface, and thicknesses have been observed to vary by hundreds of feet over small distances."

IL1-3

This is an incorrect statement about the thickness of the Mt. Simon. While this statement may be true for the western part of the basin, it is not correct for the central part where the two proposed FutureGen sites are located. The Mt. Simon is thin on top of eroded, high-relief surfaces also know as, Precambrian highs, because it was never deposited on these features. However, regional mapping suggest that the Mattoon and Tuscola sites are not in areas with Precambrian highs since these high areas usually occur on the western and southern part of the Illinois Basin. It is highly probable that the Mt. Simon should be at least 1300 feet thick at both sites. In addition, recent seismic reflection data across the two injection sites does not show any Precambrian highs.

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

(Page 3-66, Section 3.2.3.3)

Description of Eau Clair seal.

"While the Eau Claire seal is well documented as a good seal for natural gas storage at other locations, if it has more siltstone than shale at the Mattoon or Tuscola sites, the seal is not likely to be as effective as if it is predominantly shale."

IL1-4 This is a misleading implication. It is highly unlikely that the Eau Claire is siltier at Mattoon and/or Tuscola given the depositional nature of sediments which get finer as they move distally from their source. Given what we know of the Eau Claire at Manlove Gas Storage field and the direction of the sediment source from that location, Tuscola and Mattoon, which are down dip from Manlove, should be more shaley, not potentially silty. The available well control in the Illinois Basin suggests that the Eau Claire has higher siltstone content to the north of the two proposed sites; therefore, it is extremely probable that the Eau Claire will have thicker and higher clay content at the prospective site than wells to the north. All of the geologic data suggests that the Eau Claire seal at Mattoon and Tuscola will be as good as or better than the same interval at the natural gas storage projects at other locations.

(Page 3-100, Table 3-13)

Pipeline safety

"The pipeline would be buried to minimize accidental damage. Deeper burial of the pipeline (deeper than 3 feet [0.9 meters]) in areas with higher population densities could reduce the risk of damage caused by digging and trenching."

#7

It is not apparent in the risk assessment whether pipeline depths were taken into account. If an offeror proposes, or the Alliance decides upon, a deeper pipeline depth, such as 4 or 5 feet below surface, how would this impact the results of the risk analysis? Is the depth of the existing pipeline at Odessa the same as the depth used in the risk analysis?

(Page 3-105, Table 3-14)

Best Management Practices

"Monitoring, cleanout, and inspection procedures for the CO2 pipelines need to be developed and followed. These plans should include use of safety valves to isolate sections of the pipeline, bleed valves, and continuous pipeline monitoring with computer models to rapidly interpret changes in fluid densities, pressures, etc."

#8

A software-based, mass balance pipe monitoring system may not be as effective at identifying small leaks of CO2 and H2S (due to the high pressure and high flows of the supercritical fluid) as installing actual capture and sensing devices. At 3800 pounds per minute flow through the pipe (minimum based on 1 million tons per year), if the equipment's sensitivity is 2%, then a leak of nearly 80 pounds per minute may be indistinguishable. It seems that a state of the art system for detecting and monitoring gas leaks is called for. It is proposed that DOE include a pipe monitoring system to be a part of the state of the art system monitoring to ensure leaks are identified and located quickly.

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

(Page 4.2-3, Section 4.2.2.1)

Existing Air Quality

M21-9 "The nearest non-attainment and maintenance areas are located in Indianapolis, Indiana (146 miles [235.0 kilometers] away) and Vigo County, Indiana (46 miles [74.0 kilometers] away)."

Information originally provided by IEPA for Section 4.2 indicates that the closest NAA to Mattoon, IL is St. Louis, MO-IL which is approximately 72.3 miles from the proposed site. The closest maintenance area (MA) and distance indicated in the EIS is correct for Vigo County, IN.

(Pages 4.2-5, 4.2-10, 4.11-5, 4.11-10, 4.12-2, 4.19-5, 4.19-8, 4.19-5)

Nearby residences

M21-10 "There are two residences located adjacent to, two residences located within 0.25 mile (0.5 kilometer) of, and 20 additional residences located within 1 mile."

The local economic development authority, Coles Together, has options on several of the residential properties that are closest to the power plant site and is negotiating others. If FutureGen is located in Mattoon these properties will be purchased and vacated thus reducing the population with the greatest impacts and/or exposure risks.

(Pages 4.2-14, 5.2-14, 6.2-14, 7.2-15)

Odors

#9 "Operation of the FutureGen Project may cause noticeable odors. The chemical components that could cause noticeable odors are hydrogen sulfide (H2S) and ammonia (NH3)."

There should be discussion of the potential for odor issues, at minimum in the uncertainty section, and possibly in a separate section, using the Level of Distinct Odor Awareness of 0.01 ppm developed by the Acute Exposure Guideline Levels Committee as the basis for a quantitative assessment.

(Page 4.4-8, Section 4.4.2.3) and (Page 5.4-9, Section 5.4.2.3)

Relation of primary seal to active or transmissive faults

IL1-5 "The Illinois Department of Natural Resources (IDNR) has mapped no significant faults within approximately 50 miles (81 kilometers) of Mattoon (ISGS, 1997)."

"As previously discussed, significant faulting and fracturing is likely to be present along and near the steep western flank of the Tuscola Anticline located about 3 to 4 miles (4.8 to 6.4 kilometers) east of the Tuscola Sequestration Site."

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

While the first statement is correct, the Tuscola Anticline would be within 50 miles of the Mattoon site as well. A fairer, more accurate statement for both locations might be:

IL1-5

> "The Tuscola Anticline is located about 3 to 4 miles (4.8 to 6.4 kilometers) east of the Tuscola Sequestration Site {approximately 24 miles north-northeast of the Mattoon Sequestration site}. This setting of a steep flank of an anticline may contain some faults and fractures, but to date none have been found or mapped in the area of review by the Illinois Department of Natural Resources (IDNR).

(Page 4.4-11, Section 4.4.3.2) and (Page 5.4-12, Section 5.4.3.2)

Modeling of Fault Leakage Scenarios

"The results of the numerical modeling of the fault leakage scenario for the proposed Mattoon Site indicate that, for permeabilities of 1 md and higher, the amount of CO2 leakage through the fault would be relatively small, as measured by the CO2 flux rates, extent of the plume, and CO2 gas pressure at the base of the overlying Maquoketa formation. If the fault were 321 feet (97.8 meters) long and had a permeability of 50 md, the steady-state flux rate would be about 173 tons (157 metric tons) of CO2 per year, or 0.006 percent of the 2.8 million tons (2.5 MMT) per year injection rate. The maximum plume extent occurred for the higher permeability faults and was 1.4 miles (2.3 kilometers) at year 60. The plume extent for the 1 and 0.01 md cases was essentially zero. Significant permeation of the Eau Claire shales is unlikely to occur at fault permeabilities less than 1 md (FG Alliance, 2006a)."

IL1-6

"The results of the numerical modeling of the fault leakage scenario for the Tuscola Site indicate that, for permeabilities of 1 md and higher, the amount of CO2 leakage through the fault is at least 2 percent of the total amount injected, as measured by the CO2 flux rates, extent of the plume, and CO2 gas pressure at the base of the overlying Maquoketa formation. If the fault was 321 feet (97.8 meters) long and had a permeability of 50 md, the steady-state flux rate for the first 60 years would be about 1.1 million tons (1 MMT) of CO2 or 2 percent of the 55 million ton (50 MMT) per year injection rate. The maximum plume extent occurred for the higher permeability faults and was 2.5 miles (4 kilometers) at year 100 and was still expanding. The plume extent for the 1 and 0.01 md cases was essentially zero. Significant permeation of the Eau Claire shales is unlikely to occur at fault permeabilities less than 1 md (FG Alliance, 2006b)."

The major difference is that the Mattoon site says that results of numeric modeling suggest leakage would be "relatively small (p. 4.4-11)." For Tuscola, the conclusion is that "at least 2 percent of the total amount of injected" CO_2 could leak.

For the Mattoon and Tuscola sites the EIS leakage models have similar thicknesses of porous intervals, similar permeabilities, and place a 321 foot long fault with a 50 md permeability through the cap. **BUT:**

With both sites nearly the same and the same theoretical modeled fault, how can there be 1.1 million tons of leakage out of 55 million tons injected for the Tuscola site but only 173 tons of leakage out of 2.8 millions tons injected per year at the Mattoon site? - 2 percent versus 0.006 percent?

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IL1-6

Mattoon – The EIS has a steady-state flux rate of 173 tons of CO2 per year for the 2.8 million tons injected per year.
Tuscola – The EIS has a steady-state flux rate for the first 60 years of 1.1 million tons or 2 percent of the 55 million ton per year injection rate.

Is the steady-state flux rate of 173 tons per year for the Mattoon site also for the first 60 years?? Is the Tuscola leakage 1.1 million tons over 60 years? If so then the leakage is 0.65 percent per year.

IL1-7

They also look at different lengths of times for the maximum plume extent:

Mattoon – for the higher permeability faults 1.4 miles at year 60
Tuscola – for the higher permeability faults 2.5 miles at year 100 and was still expanding.

Why are the maximum plume extents not compared for the same time periods?

The comparison of sites can only be reasonably accomplished if the information from the models is shown with steady-state flux rates for the same time periods and the same injection rates. Since both sites have similar thicknesses of porous intervals and permeabilities, it seems the differences in the modeled results can only result from errors in the assumptions

The assumptions used to model the fault leakage scenarios for the two sites are very different. Both sites are supposed to have a maximum of 2.8 million tons injected PER YEAR – not 55 million ton(s) per year at Tuscola and 2.8 millions tons injected per year at Mattoon. The 55 million ton figure is the total amount injected over the plant lifetime, not an annual rate, and is an obvious error.

Does the modeled leakage result from faults with the same permeabilities since 4 different permeabilities were used in the modeling? Is the extent of the plumes based on the same permeability faults?

The Tuscola modeling needs to be redone with the same assumptions as for Mattoon.

IL1-8

(Page 4.6-3, Section 4.6.2.1) and (Page 5.6-3, Section 5.6.2.1)

Aquifer designations

"The aquifers that lay beneath the injection site would not fit EPA's definition (EPA, 2006) of an Underground Source of Drinking Water (USDW), which includes any aquifer or part of an aquifer that:

- Supplies any public water system, or contains a sufficient quantity of groundwater to supply a public water system and currently supplies drinking water for human consumption or contains fewer than 10,000 milligrams per liter of total dissolved solids (TDS); and
- Is not an exempted aquifer.

Following EPA's definition above, the shallow aquifers near the sequestration site cannot be classified as USDW because they do not supply any public water system or have the quantity of water to do so."

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IL1-8

The statement that the aquifers beneath the injection sites would not fit EPA's definition of an underground source of drinking water (USDW) may not be correct. An aquifer only needs to contain a sufficient quantity of groundwater to supply a PWS and currently supplies a PWS, or contains less than 10,000 mg/l TDS.

A PWS, as defined by EPA, must serve 15 connections or 25 people for at least 60 days per year. Figuring 25 people at 75 gal/person/day = 1875 gal/day divided by 1440 minutes/ day = 1.3 gallons/minute. Therefore, an aquifer only needs to supply 1.3 gal/minute for 60 days a year to have "sufficient quantity". This equates to 112,500 gallons per year.

Without a demonstration that the aquifer(s) in question can not supply this amount or contains greater than 10,000 mg/l TDS we would consider them to be USDWs. Generally, throughout Illinois the 10,000 mg/l TDS is the controlling factor for what is and what isn't a USDW for purposes of the UIC Program.

Since this project will be designed and built following the Class I construction standards and will clearly be injecting well below the lowest USDW this shouldn't be a major issue.

(Page 4.7-4, Section 4.7.2)

Stream quality

M21-11

"Cassell Creek is not listed as impaired (IEPA, 2006)."

This is wrong. While Cassell Creek is not included on the 303(d) list, it <u>is</u> listed as not supporting its Aquatic Life Use due to a recent fish kill.

(Page 4.8-2, Section 4.8.2.1) and (Page 5.8-2, Section 5.8.2.1)

Wetland mitigation

IL1-9

"IDNR has the authority to regulate jurisdictional wetlands through Section 404 and the IWPA."

Remove the above sentence. It restates the last paragraph of the previous page and its reference to Section 404 could be confusing. Replace with: "Impacts to any of the wetlands identified in the wetland delineation will require mitigation under the IWPA.

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(Page 4.8-8, Section 4.8.3.1) and (Page 5.8-7, Section 5.8.3.1)

Wetland Mitigation

IL1-10

"The amount of mitigation required for the proposed power plant site and other project components (e.g., utility corridors) is not known at this time. Ratios have been established by the USACE regarding mitigation. For example, a 2:1 ratio would require 2.0 acres (0.8 hectares) of wetland creation for every acre (0.4 hectare) of wetland loss. Typical mitigation ratios for unavoidable impacts to wetlands would be 1:1 for open water and emergent wetlands, 1.5:1 for shrub wetlands, and up to 2:1 for forested wetlands. The appropriate type and ratio of mitigation would be determined through the Section 404 permitting process."

This paragraph should include a sentence about IWPA requirements such as: "Mitigation required by IWPA could be as high as a 5.5:1 ratio, but is unlikely to be any higher than a 4.0:1 ratio."

(Page 4.11-2, Section 4.11.2.2)

Zoning

M21-12

"Because the proposed Mattoon Power Plant Site lies 1 mile (1.6 kilometers) west of the Mattoon city limits, it lies within the extra-territorial area where the City of Mattoon Zoning Ordinance may be applied, but the area is currently not zoned."

Please replace the above sentence with the following:
"On May 15, 2007 the City rezoned the portion of FutureGen proposed site that lies within the 1.5 mile extra-territorial area from the existing rural-suburban use to industrial use."

(Page 4.11-7, Paragraph 3)

Right-of-ways

M21-13

"North of the Mattoon city limits, the corridor lies on private property for 2 miles (3.2 kilometers). Three property owners own the 2 miles (3.2 kilometers) of ROW, which would require new easements in an area that appears to be primarily farm land. Option contracts have been secured to purchase the three necessary easements. For the last 3.5 miles (5.6 kilometers) of the corridor, the pipeline would be placed on the public ROW of CR 900N. The road ROW is 60 feet (18 meters) wide, with the roadway surface averaging 20 feet (6 meters) wide."

Please replace the above sentences with the following:
"North and west of the Mattoon city limits, the corridor lies on private property for 5.5 (8.9 kilometers) miles. Three property owners own the first 2 miles (3.2 kilometers) of ROW, which would require new easements in an area that appears to be primarily farm land. For the last 3.5 miles (5.6 kilometers) of the corridor, the pipeline would be placed on the ROW of CR 900N. The ROW is proscribed rather than dedicated, and therefore new easements will be required from the current land owner. Option contracts have been secured to purchase two of the three necessary easements from the property owners in the first two miles. Negotiations continue for the remaining easements."

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(Page 4.11-7, Section 4.11.3.2

Transportation Corridors

M21-14 "Assuming the existing road ROWs are of sufficient size to accommodate any new construction, there would be no change to the land use of the transportation corridors."

Please replace the above sentence with the following:
"The only change to the existing road ROW would be at County Highway 13 and the intersection of State Route 121. The intersection would be rebuilt so that CH13 would approach SR 121 at right angles. A turn lane would be constructed on SR 121."

(Page 4.19-4, Section 4.10.2.2)

Sales Tax Collections

"Coles County collected $45 million in property taxes in 2003 and $9.2 million in sales taxes in 2004 (FG Alliance, 2006a). The counties located within the ROI each collected an average of $38.9 million in sales taxes (FG Alliance, 2006a)."

The figure for average sales tax collections is incorrect - $38.9M is far too high. Our analysis of sales tax data for this region gives approximately $3.6M. See the spreadsheet below:

Sales Tax Liability for Calendar year 2004- collected 02/04 through 01/05
(source- Illinois Department of Revenue report to Tuscola City government)

M21-15

	State Sales Tax	Municipal Tax	Home Rule Tax	Non-Home Rule Tax	County Tax	Countywide sales tax	County ROT for Sublic Safety	Total Sales Tax	Sales tax less State portion
	(5% of State's 6.25 sales tax rate)	*(1% of State's 6.25 sales tax rate)*	*(locally imposed tax rate)*	*(locally imposed tax rate)*	*(1% of State's 6.25 sales tax rate)*	*(.25% of State's 6.25 sales tax rate)*	*(locally imposed tax rate)*		
Douglas	$9,058,419	$1,787,760	$224,558	$87,125	$283,216	$454,763		$11,895,841	$2,837,422
Coles	$25,174,371	$5,772,686	$0	$1,875,570	$272,997	$1,258,449		$34,354,073	$9,179,702
Cumberland	$1,595,858	$350,739	$0	$0	$23,998	$79,745		$2,050,340	$454,482
Moultrie	$4,523,272	$782,826	$0	$0	$286,699	$226,040		$5,818,837	$1,295,565
Champaign	$90,256,640	$20,837,964	$12,330,091	$0	$946,226	$4,511,204	$3,879,529	$132,761,654	$42,505,014
Edgar	$5,778,968	$1,326,920	$0	$352,006	$135,823	$288,927		$7,882,644	$2,103,676
Macon	$55,307,269	$13,017,177	$9,635,081	$937,188	$303,655	$2,764,646	$2,231,963	$84,196,979	$28,889,710
Piatt	$3,987,042	$847,603	$0	$0	$76,096	$199,185		$5,109,926	$1,122,884
Clark	$4,677,610	$959,397	$0	$0	$153,890	$233,705	$693,614	$6,718,216	$2,040,606
Effingham	$28,798,083	$6,352,176	$0	$0	$297,389	$1,439,581		$36,887,229	$8,089,146
Shelby	$4,658,393	$953,803	$0	$0	$156,812	$232,897		$6,001,905	$1,343,512
Tuscola ROI	$195,681,839	$44,723,675	$22,189,730	$3,251,889	$2,328,710	$9,782,959	$6,111,492	$284,070,294	**$88,388,455**
Mattoon ROI	$78,486,006	$16,959,387	$224,558	$1,962,695	$1,475,001	$3,925,180	$693,614	$103,726,441	**$25,240,435**

Tuscola average per county in ROI $11,048,556.88
Mattoon average per county in ROI $3,605,776.43

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(page 5.2-3, Section 5.2.2.1)

Existing Air Quality

T32-5 "The nearest non-attainment areas are located in Indianapolis, Indiana (152 miles [244.6 kilometers] away) and Vigo County, Indiana (71 miles [114.3 kilometers] away)."

This location is correct; however the distance appears to be in error. IEPA had originally provided information indicating that the distance to the nearest nonattainment area (O_3) is 86.3 miles not 152 miles.

(Page 5.2-4, Section 5.2.2.2)

Cities within ROI

T32-6 "Tuscola is not within 50 miles (80.5 kilometers) of any of the 10 largest cities in Illinois. The closest of the 10 largest cities to Tuscola is Springfield to the west."

While technically correct, the twin cities of Champaign and Urbana, when considered as a single metropolitan area, would be the sixth largest in the state, and is only 24 miles north of Tuscola.

(Page 5.4-3, Section 5.4.2.1)

Thickness of optional reservoir

T32-7 "At the Tuscola Site, the St. Peter is estimated to be over 200 feet (61 meters) thick with good lateral continuity and permeability."

The correct figure is 100 feet. The St. Peter at Mattoon is known to be 200ft thick, but the value for Tuscola is in doubt, but is estimated at 100ft. Other references to this thickness in the EIS correctly use the 100ft. figure.

(Page 5.4-10 , Section 5.4.3.1)

Powerplant site surface geology

"The surficial geology of the power plant site includes glacial deposits that are likely 40 to 250 feet (12.2 to 76.2 meters) thick."

T31-8

While the thickness of the surficial deposits may have this large range in thickness within a 5 to 10 mile radius of the Tuscola site, at the site itself, the thickness is about 180 to perhaps about 220 or a little more. This is based on several pieces of information. There is a tributary bedrock valley mapped on the statewide bedrock topography map. In addition, the site is on the east flank of the Arcola moraine, a late Wisconsin feature of the Lake Michigan lobe. The glacial sediment in the moraine is a few 10's of feet thicker than surrounding plain.

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The ISGS drilled two test holes on the south side of the site with the GeoProbe last year and were stopped by resistance to drilling at about 42 feet. A paleosol was encountered at this depth, developed in older glacial deposits. (There are two paleosols developed in older glacial deposits at the nearby Tuscola quarry, one at about 20 feet, and one at about 35 feet).

There are few water-well records and engineering boring records that penetrate the glacial deposits and encounter rock. None are at the site, but ones near the site indicate a thickness of about 200 feet. At the town of Tuscola, records indicate a thickness of about 120 to 150 feet, and at the nearby Tuscola quarry it is just 40 feet thick.

We suggest replacing this statement with the following"

> "The surficial geology of the power plant site includes glacial deposits that are about 200 feet thick. The site is underlain by a tributary to the Pesotum bedrock valley segment of the Mahomet bedrock valley system which has an elevation as low as 450 feet at the site. Within a 5-mile radius of the Tuscola site, the thickness of unconsolidated deposits ranges from less than 50 feet to more than 200 feet. At the Tuscola Quarry, 4 miles east of the Tuscola site, the thickness of unconsolidated deposits is about 40 feet."

T32-8

Sources of information:

Herzog, B.L.. B.J. Stiff, C.A. Chenoweth, K.L. Warner, J.B. Sievering, C. Avery, 1994
Illinois State Geological Survey, Champaign, Illinois
ISGS GIS Database
GISDB_BEDGEO.IL_Bedrock_Topography_1994_Ln

Illinois State Geological Survey, 1994
Illinois State Geological Survey, Champaign, Illinois
ISGS GIS Database
GISDB_QTGEO.IL_Drift_Thickness

Hansel, K., Berg, R. C., Phillips, A.C., and Gutowski, V.G, 1991, Glacial sediments, landforms, paleosols, and a 20,000-year-old forest bed in east-central Illinois: Geological Society of American North-Central Section 33rd Annual Meeting, April 1999, Illinois State Geological Survey, Guidebook 26, 31p.

(Page 5.4-12, Section 5.4.3.2)

Nearby wells

"The Tuscola Site subsurface ROI is surrounded by operating and abandoned petroleum exploration and production wells, with several hundred within 5 miles (8.0 kilometers) of the proposed injection site, and likely approaching 100 within 2 miles (3.2 kilometers)."

T32-9

According to ILOIL (http://runoff.isgs.uiuc.edu/website/iloil/viewer.htm), there are 197 operating and abandoned oil and gas wells within a two mile radius of the Tuscola injection site. Of the 197 wells, 9 are active gas storage wells operated by NGPL in the Cooks Mills Consolidated field in the Cypress

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T32-9 sandstone, 5 are active oil wells in the Rosiclare, McClosky, and St Louis at Cooks Mills, 90 are plugged Rosiclare oil wells at Cooks Mills, 37 are plugged Rosiclare oil wells in the Chesterville East field about 1.5 to 2.0 miles N-NW of the injection site, and 56 are plugged dry holes. All the dry holes had Mississipian targets, except 3 drilled to Devonian, and 3 to the Trenton.

T32-10 **(Page 5.4-6, Section 5.4.22)**

Seismic activity

"The most recent seismic event, on December 6, 2006, was a 2.7 magnitude earthquake centered 101 miles (162.5 kilometers) from the midpoint between the power plant and sequestration site."

The 2006 date is incorrect. Chapter 4 references this same event as occurring in 2005.

T32-11 **(Page 5.6-1, Section 5.6.1.2)**

Impacted aquifers

"Because neither the specific aquifer to be used for the water supply nor well locations have yet been selected, the analysis addresses a number of aquifers that could be used."

The process water supply source description and the analysis that follows this statement clearly indicate that the Mahomet aquifer is the only aquifer that might be impacted (indirectly) by the water supply from the Kaskaskia River.

T32-12 **(Page 5.6-6, Section 5.6.3.2)**

CO2 Plume Radius

"Reservoir modeling indicates that the largest plume radius would be approximately 1.2 miles (1.9 kilometers) over 50 years of injection at a rate of 1.1 million tons (1 MMT) per year."

The radius here is incorrect. In all other references to the Tuscola plume radius the number given is 1.1 miles (1.8 kilometers).

T32-13 **(Page 5.10-5, Section 5.10.3.1)**

Historic preservation at powerplant site.

"IHPA concurrence with the results and recommendations contained in the archaeological survey report is pending."

On January 30, 2007, IHPA concurrence was received stating that no significant historic, architectural, and archaeological resources are located in the proposed project area. This letter is attached in Appendix A of the EIS.

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(Page 6.4-10, Section 6.4.3.2) and (Page 7.4-10, Section 7.4.3.2)

Monitoring

TX7-1 "Although injection-induced seismicity is unlikely, monitoring methods discussed in Section 6.4.4 would further reduce the possibility of accidentally inducing seismicity"

The referenced section 6.4.4 (7.4.4) does not exist in the EIS. In fact, no section of the document thoroughly addresses the means and methods that will be used to monitor the injected CO2 plume or to provide early detection of leaks from the CO2 pipelines and storage formations.

(Page 6.19-4, Table 6.19-3) and (Page 7.19-3, Table 7.19-3)

Wage rates

TX7-2 "Table 6.19-3 (7.19-3) provides 2003 average hourly wages for Freestone, Leon, and Limestone counties (Ector County) for trades that would be required for construction of the proposed project. The minimum and maximum wages for these trades were not available.

Wage rates for these areas of Texas are available at the Texas Workforce Commission website: http://www.tracer2.com/cgi/dataanalysis/AreaSelection.asp?tableName=Oeswage. Also, the wages sited by this source seem significantly higher than those given in the corresponding tables.

(Page C-4, Table C.1-2)

G9-7 Air Quality Regulations

1. With respect to permitting, the facility will be subject to PSD not NSR requirements, the citation to 35 Ill. Adm. code 203 does not seem appropriate here.

G9-8

2. Since the source appears to be major, there probably should be a citation to Section 39.5 of the Illinois Environmental Protection Act 415 ILCS 5/39.5 for CAAPP

G9-9

3. Section 111 of the CAA is mentioned when addressing toxics but only in the context of mercury. 40 CFR part 63 contains other types of recordkeeping and reporting for nonmajor sources of HAPs, that may be applicable. Also many sources in Illinois are required to report toxic emissions pursuant to 35 IAC 232.

G9-10

4. While many provisions of 40 CFR 60 are listed, Subparts VV and KKKK are not. These may be applicable unless the source meets certain requirements.

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(Risk Assessment, Page 4-2, Table 4.1) and (Risk Assessment, Page 4-12, Table 4.5)

Pipeline diameters

1. The diameters of the pipelines for Mattoon and Tuscola given in these two tables differ (19.3" and 16" as opposed to 14.4" and 14.4").

#10

2. The calculations of these diameters for Tuscola and Odessa are suspect. It is expected that the diameter of the Tuscola pipeline would be slightly larger than the diameter of the Mattoon pipeline due to their difference in length (0.5mi. vs 11 mi.) if they are delivering the same quantities of CO2 at the same operating conditions. In like manner, a 12" diameter pipeline for Odessa seems unreasonably small compared to the Jewett pipeline since Odessa's is longer. Was the same methodology used to calculate pipeline diameters for all four sites? The diameter will impact the amount of waste water to be handled during hydrotesting, and the results of the risk analysis.

3. The small 12" diameter pipeline was apparently used in the risk assessment for the entire length of the pipeline at Odessa. The risk assessment should have been performed with the diameter, valving and structures of the existing pipeline that is proposed, or the diameter adjusted to reflect a new pipeline adequate for the entire distance. The risk assessment was performed on a virtual pipeline next to the existing pipeline, so it is not representative of the proposal to use the existing pipeline.

(Risk Assessment, Page 4-21, Section 4.5.1.2)

Risk Results

#11

"No individuals are expected are expected to be affected by CO2, since the impact zone is within 33 feet (10 meters) of the injection well."

The words "are expected" are repeated in this sentence.

(Risk Assessment, Page 4-27, Section 4.5.3.2)

Risk Results

#12

"Based on the population density, less than 1 individual is estimated to be potentially exposed to levels of H2S that can cause adverse effects (0.051 ppmv) from a wellhead rupture, but none for CO2. Thus, these results indicate that although there is greater likelihood of health effects for nearby populations from H2S than CO2 releases, these may only be mild transient effects."

The H2S level given here (0.051ppmv) should be 0.51 ppmv.

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(Risk Assessment, Page 4-32, Section 4.5.5)

Risk Results for Co-Sequestration Experiment

#13

"During the time that it would take for the cosequestered gas to be produced and to be transported to the injection wells, a pipeline rupture or leak could occur at the higher H2S concentration of 20,000 ppmv. Thus, the predicted concentrations of H2S from a release could be 200 times higher than the standard scenarios where H2S was a maximum of 100 ppmv. During co-sequestration the H2S concentrations would be greater than the NIOSH's IDLH criterion of 100 ppmv for 30-minute exposures."

If the Alliance plans to co-sequester 2% H2S with the CO2, then the risk assessment should be updated to evaluate the potential consequences of releases at that concentration, in the same manner as those evaluations conducted for the 100 ppmv concentration and discussed in Sections 4.17,5.17, 6.17 and 7.17 of the Environmental Impact Statement.

(Risk Assessment, Tables 5-13, 5-16, 5-19 and 5-22)

G9-11

Chronic effects on biota

G9-12

Assessment of risks of H2S to ecological receptors is almost non-existent, even though such risks could be significant since animals, especially burrowing animals, will likely be the most highly exposed receptors following post-injection releases. Although there are no existing ecological criteria/screening values, at minimum the assessment should provide some discussion of H2S ecological risks in the uncertainty section (Section 6.3). Beyond this, it may be possible to quantitatively address ecological risks using the procedures discussed in a recent paper (P. Gallegos *et al*. 2007. Wildlife ecological screening levels for inhalation of volatile organic chemicals. Environ. Toxicol. Chem. 26: 1299-1303.) if suitable toxicological data are available.

(Risk Assessment, Page 5-24, Section 5.3.4.3)

Undocumented wells

G9-13

"The potential for release due to poorly abandoned wells is treated in the same manner as poorly constructed and abandoned deep wells. The number of undocumented wells per site was estimated based expert judgment using information on the degree of historical mineral exploration activity in the area."

The number of undocumented wells, estimated based on expert judgment for the four facilities, seems low for the Texas facilities (13 for Jewett, 2 for Odessa) in comparison to the Illinois facilities (2 for Mattoon, 3 for Tuscola), considering the long history of oil and gas exploration in Texas and the existence of on-site and close vicinity wells at the Texas sites versus none known in the vicinity of the two Illinois sites. The Texas Land and Mineral owners Association (www.tlma.org/water.htm) estimates 32% of the oil and gas wells ever drilled in Texas are unproductive and waiting to be plugged by someone. Also, change "poorly abandoned wells" to "undocumented wells" in the first line of Section 5.3.4.3, to be consistent with the title of this section.

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(Risk Assessment, Page 5-26, Section 5.4.1)

Post injection exposure analysis

G9-14 "The injection site is planned to be located in the center of the 444-acre (180-hectare) plant site property."

Since the injection site at the proposed Mattoon facility will be within the plant boundary, it may be appropriate to evaluate the indoor inhalation pathway for workers at the facility, and to evaluate corresponding mitigation and/or early warning measures. CO2 and H2S monitoring and warning devices placed within buildings should be a minimum design component.

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

Response to Comment #1: Flare releases could not be modeled in accordance with EPA modeling guidance with any greater accuracy because of the lack of information at the current preliminary/conceptual design of the FutureGen Project. To get a sense of the concentration of pollutants from the FutureGen Project, the DOE and the Alliance assumed a scenario where all the emissions would be released from a single source (i.e., the heat recovery steam generator) and that unplanned restarts would contribute the most emissions as would be the case of flaring events. The emissions and predicted concentrations presented in the EIS are based upon a conservative "emissions envelope," which was estimated using the worst-case operating scenarios (i.e., multiple unplanned restart events) and multiple designs cases. Once a site is selected and the FutureGen Project design is complete pollutants specific to flare releases and associated concentrations would be addressed further as part of the air permit application process. Therefore, the text will remain as presented in the EIS.

Response to Comment #2: The text has been revised in Section 2.5.2.2 as follows, "In terms of DOE's research program, the total timeline includes 1 year of baseline data collection, ***4*** years of active injection and 2 years of post-injection monitoring."

Response to Comment #3: Odor releases from sources associated with the FutureGen Project could not be quantified because of the lack of data at the current preliminary/conceptual stage of the FutureGen Project design. Assumptions about the types of odors that would be released from the FutureGen Project and the conclusion that the odors would be limited to the facility boundaries are based on a similar situation at an existing power plant (Wabash River Coal Gasification Repowering Project, Terre Haute, Indiana: a 262 MWe commercial scale integrated gasification combined cycle [IGCC] power plant – see www.fossil.energy.gov/programs/powersystems/publications/Clean_Coal_Topical_Reports/topical20.pdf for an overview) and information in an EIS for a proposed (and permitted) power plant (Orlando Gasification Project, Orlando, Florida: a 285 MWe commercial scale IGCC power plant – see www.netl.doe/gov/technologies/coalpower/cctc/EIS/orlando_pdf/FrontMatter%20FINAL%20revised%2011207.pdf for an overview). Referencing an existing IGCC power plant and the EIS for another proposed IGCC power plant is the best available information at the site selection stage. The design work and equipment selection is not yet available to support more detailed analyses.

Once a site is selected and the FutureGen Project design is complete, odor releases and associated concentrations could be addressed further as part of the air permit application process.

Response to Comment #4: In Table S-12 and Table 3-13, Summary Comparisons of Impacts, Wetlands and Floodplains, it is stated that for utility and transportation corridors in the floodplains, wetlands would be impacted in certain segments and that there would be temporary impacts from the placement of construction equipment and trenching for underground utilities. Similar statements of potential impacts for utility and transportation corridors were presented in Section 4.8.3.1 and Section 5.8.3.1. Section 3.1.8 does state that all proposed utility corridors for all four proposed sites would involve construction within the 100-year floodplain, yet it further states that these impacts would be temporary. It was decided to show upper bounds for all impacts for all four sites because at this stage of the project it has not been decided what corridors or options would be selected.

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

Response to Comment #5: The hazard analysis assumed that a Claus Unit would be installed. No analyses were done for the situation where sulfuric acid would be produced instead of elemental sulfur. The Alliance has never considered using a sulfuric acid production plant. However, if this option were pursued, DOE would evaluate this design change in the Supplement Analysis.

Response to Comment #6: The effect of slow leakage from an injection well or other wells was estimated in the same manner using the same flux rate, and regardless of the probability of an accident occurring. The other wells were considered to be located near the injection wells, since that is where a release of CO_2 could occur. The number of people potentially affected by hypothetical leakage from a well is influenced by the meteorological conditions used in the modeling for each site, the volume of gas released from a well, and the population in the vicinity of a well. The potential area of impact from a post-injection well release was estimated using EPA's SCREEN3 model. These predicted areas are small, as shown in the figures as circles in Section 5 of the Risk Assessment (Figure 5-3 Jewett, Figure 5-4 Odessa, Figure 5-5 Mattoon, Figure 5-6 Tuscola). The potentially affected population was estimated based on the population density in the entire circle, because the release could be a continuous source and wind directions and stability conditions could vary. With respect to potential impacts of a release, the proximity of population is the most important factor. There are differences in the number of people near the injection wells at each site. The population densities are lowest in Odessa and the immediate vicinity of the injection site at Mattoon. The area around the Tuscola injection site is sparsely populated to the south, but has a higher density to the north. Jewett has a low population density at one of the injection sites, but has Texas Department of Criminal Justice (TDCJ) facilities near the other injection site.

The probability shown in Section 6.2, Table 6-11, in the Risk Assessment is "zero" only for release from slow deep oil and gas wells at Mattoon, Tuscola, and Odessa. There could be leakage from the injection well, the observation wells, or undocumented deep wells at all the sites.

Response to Comment #7: The standard depth of burial for pipelines is 3 feet (1 meter). Burying the pipeline to a deeper depth has been used in urban areas to reduce the potential for pipeline disturbance that might cause a pipeline punctures. Burying the pipeline deeper would decrease the probability of a rupture, but a pipeline rupture or large hole is still expected to release gas to the atmosphere.

Response to Comment #8: Suggested monitoring and mitigation measures were provided in Table S-16 of the EIS and included in-line inspection vehicles and intelligence pigs in the pipeline to detect early corrosion, frequent clean-outs, and bleed valves to control the location and direction of releases should a puncture occur, in addition to automated systems such as a Supervisory Control and Data Acquisition (SCADA) system. Because the CO_2 would be highly pressurized within the pipeline, even a small leak (<1 percent) would result in a pressure and temperature change that would be detected by the required computational pipeline monitoring system. Even smaller leaks (<0.1 percent) would be detectable through noise or snow visible at the surface during periodic required patrols. As a project that would advance all aspects of CO_2 capture, transport and sequestration, additional pipeline monitoring measures may be evaluated by the FutureGen Alliance.

G8. FutureGen Illinois Team (Swager, Ronald – Patrick Engineering)

Response to Comment #9:

Assumptions about the types of odors that would be released from the FutureGen Project and the conclusion that the odors would be limited to the facility boundaries are based on a similar situation at an existing power plant (Wabash River Coal Gasification Repowering Project) and information in an EIS for a proposed (and permitted) power plant (Orlando Gasification Project). This approach of both referencing an existing IGCC power plant and referencing the EIS for another proposed IGCC power plant is sufficient here where we are at the site selection stage and the design work and equipment selection is not yet available to support more detailed analyses. Once a site is selected and the FutureGen Project design is complete, the issue of odor releases and associated concentrations could be addressed further as part of the air permit application process.

Response to Comment #10:

1. The pipeline diameters in Table 4-1 of the Risk Assessment were changed to 14.4 inches for Mattoon and Tuscola, but the diameters are accurate elsewhere (in Tables 4-5 through 4-8). This typographic error did not influence the risk calculations.

2. The pipeline diameters were provided by the FutureGen Alliance and were based on required well head pressures, pipeline length, friction pressure drop, and bounding soil temperature conditions. The volume in a pipeline segment between the check valves was computed for each site to determine maximum gas release scenarios for the Risk Assessment.

3. The outside diameter of the existing CO_2 pipeline at Odessa is 16 inches, however, the inside diameter of 12.8 inches was used to calculate quantities of gas in the pipeline for the Risk Assessment.

Response to Comment #11:

This sentence has been corrected in the revised Risk Assessment.

Response to Comment #12:

This sentence has been corrected in the revised Risk Assessment to show the adverse effects level for H_2S as 0.51 ppmv. Please note that the correct value of 0.51 ppmv is shown elsewhere on the same page as the typo in the Risk Assessment; the correct value was indicated in the EIS.

Response to Comment #13:

The pipeline walk method was used to estimate the potential effects of pipeline releases due to ruptures and punctures at each of the four sites for a co-sequestration test. The results have been summarized in Section 4.5.5 of the revised Risk Assessment. Appendix D has been prepared with the tabulated results and plots showing the number of people that could potentially be affected. In addition, additional mitigation measures that could be implemented during the co-sequestration test are presented.

G9. Illinois EPA (Reed, Michael T.)

Toxic and Hazardous Materials

"The FutureGen Project would use a variety of process chemicals, primarily for the treatment of process water and maintenance of the cooling towers."

#1

Have the antiscalants, biocides and other chemicals that will be used in the process water, cooling tower water, etc. been evaluated for their potential impact to local biota from cooling water drift air emissions, or any other potential air emission sources?

Air Quality Regulations

#2

1. With respect to permitting, the facility will be subject to PSD not NSR requirements, the citation to 35 Ill. Adm. code 203 does not seem appropriate here.

#3

2. Since the source appears to be major, there probably should be a citation to Section 39.5 of the Illinois Environmental Protection Act 415 ILCS 5/39.5 for CAAPP

#4

3. Section 111 of the CAA is mentioned when addressing toxics but only in the context of mercury. 40 CFR part 63 contains other types of recordkeeping and reporting for nonmajor sources of HAPs, that may be applicable. Also many sources in Illinois are required to report toxic emissions pursuant to 35 IAC 232.

#5

4. While many provisions of 40 CFR 60 are listed, Subparts VV and KKKK are not. These may be applicable unless the source meets certain requirements.

Air Quality Regulations

"The proposed FutureGen Project is a federal action under the jurisdiction of the General Conformity Rule. However, all four proposed plant sites and sequestration sites are located regions that are in attainment for all criteria pollutants. Therefore, a project located at these sites would not be subject to the General Conformity Rule."

#6

The federal general conformity requirements are mentioned, but not the state requirements at 35 IAC 255. In addition, there are several other Illinois air quality regulations that were not mentioned:

#7

1. The relevant SO2 requirements at 35 IAC 214.301.

#8

2. The relevant PM requirements at 35 IAC 212, e.g. opacity and emissions (212.123, 212.124, 212.301, 212.314, 212.323).

#9

3. The relevant CO requirements at 35 IAC 216.121 (if there is a boiler).

#10

4. The relevant NOx requirements at 35 IAC 217.121. In addition, there are upcoming statewide control regulations that may apply.

G9. Illinois EPA (Reed, Michael T.)

Chronic effects on biota

#11 Assessment of risks of H2S to ecological receptors is almost non-existent, even though such risks could be significant since animals, especially burrowing animals, will likely be the most highly exposed receptors following post-injection releases.

#12 Although there are no existing ecological criteria/screening values, at minimum the assessment should provide some discussion of H2S ecological risks in the uncertainty section (Section 6.3). Beyond this, it may be possible to quantitatively address ecological risks using the procedures discussed in a recent paper (P. Gallegos *et al*. 2007. Wildlife ecological screening levels for inhalation of volatile organic chemicals. Environ. Toxicol. Chem. 26: 1299-1303.) if suitable toxicological data are available.

Undocumented wells

"The potential for release due to poorly abandoned wells is treated in the same manner as poorly constructed and abandoned deep wells. The number of undocumented wells per site was estimated based expert judgment using information on the degree of historical mineral exploration activity in the area."

#13 The number of undocumented wells, estimated based on expert judgment for the four facilities, seems low for the Texas facilities (13 for Jewett, 2 for Odessa) in comparison to the Illinois facilities (2 for Mattoon, 3 for Tuscola), considering the long history of oil and gas exploration in Texas and the existence of on-site and close vicinity wells at the Texas sites versus none known in the vicinity of the two Illinois sites. The Texas Land and Mineral owners Association (www.tlma.org/water.htm) estimates 32 *percent* of the oil and gas wells ever drilled in Texas are unproductive and waiting to be plugged by someone. Also, change "poorly abandoned wells" to "undocumented wells" in the first line of Section 5.3.4.3, to be consistent with the title of this section.

Post injection exposure analysis

"The injection site is planned to be located in the center of the 444-acre (180-hectare) plant site property."

#14 Since the injection site at the proposed Mattoon facility will be within the plant boundary, it may be appropriate to evaluate the indoor inhalation pathway for workers at the facility, and to evaluate corresponding mitigation and/or early warning measures. CO2 and H2S monitoring and warning devices placed within buildings should be a minimum design component.

G9. Illinois EPA (Reed, Michael T.)

To: Ron Swager, Patrick Engineering

From: Michael T. Reed, Illinois EPA

Date: June 25, 2007

Subject: Illinois EPA comments on FutureGen EIS and Risk Assessment

Attached is Illinois EPA comments on the FutureGen EIS and Risk Assessment documents. The comments pertain to only those portions of the reports that are applicable to the Illinois sites (Tuscola and Mattoon). They are also regarding only those portions of the report that were requested to be reviewed.

The comments attached have been provided by the appropriate Illinois EPA staff. If there are any specific questions regarding any of the comments, please do not hesitate to contact me and I will see that you get an answer. My email is Michael.Reed@illinois.gov and I can be reached at 217-782-4651.

G9. Illinois EPA (Reed, Michael T.)

Future Gen Comments

G9-15 1. Many applicable requirements have not directly been addressed

G9-2 2. With respect to permitting, the facility will be subject to PSD not NSR requirements, the citation to 35 Ill. Adm. code 203 on page C-4 does not seem appropriate here.

G9-3 3. the source appears to be major, there probably should be a citation to Section 39.5 of the Illinois Environmental Protection Act 415 ILCS 5/39.5 for CAAPP

G9-4 4. Also on page C-4, they mention Section 111 of the CAA when addressing toxics but only in the context of mercury, 40 CFR part 63 contains other types of recordkeeping and reporting for nonmajor sources of HAPs, that may be applicable. Also many sources in Illinois are required to report toxic emissions pursuant to 35 IAC 232.

G9-5 5. While many provisions of 40 CFR 60 are listed, Subparts VV and KKKK are not, it may be applicable unless the source meets certain requirements.

G9-6 6. They mention the federal general conformity requirements on page C-9, but not the state requirements at 35 IAC 255.

G9-7 7. They omit to mention any of the relevant SO2 requirements at 35 IAC 214.301.

G9-8 8. They omit to mention any of the relevant PM requirements at 35 IAC 212, e.g. opacity and emissions(212.123, 212.124, 212.301, 212.314, 212.323.

G9-9 9. They omit to mention any of the relevant CO requirements at 35 IAC 216.121 (if there is a boiler).

G9-10 10. They omit to mention any of the relevant NOx requirements at 35 IAC 217.121. In addition, there are upcoming statewide control regulations that may apply.

G8-13 11. The assessment of risks associated with the short-term trial injection that will include 2% (20,000 ppm) H2S is inadequate, and if there is the possibility that this amount of H2S will be routinely included in the captured gas stream then the risk assessment is grossly inadequate. There should be a more in-depth analysis of the potential consequences of releases that contain 20,000 ppm H2S, including maps of the potentially affected areas and estimates of the number of people affected at each site. (Note that this will require modification of the corresponding discussion of H2S risks in Section 4.17 of the Environmental Impact Statement.)

G9-11
G9-12 12. Assessment of risks of H2S to ecological receptors is almost non-existent, even though such risks could be significant since animals, especially burrowing animals, will likely be the most highly exposed receptors following post-injection releases. Although there are no existing ecological criteria/screening values, at minimum the assessment

G9. Illinois EPA (Reed, Michael T.)

G9-12 should provide some discussion of H2S ecological risks in the uncertainty section (Section 6.3). Beyond this, it may be possible to quantitatively address ecological risks using the procedures discussed in a recent paper (P. Gallegos *et al.* 2007. Wildlife ecological screening levels for inhalation of volatile organic chemicals. Environ. Toxicol. Chem. 26: 1299-1303.) if suitable toxicological data are available.

G9-14 13. Since the injection site at the proposed Mattoon facility will be within the plant boundary, it may be appropriate to evaluate the indoor inhalation pathway for workers at the facility in the post-injection assessment.

G9-13 14. The number of undocumented wells, estimated based on expert judgment for the four facilities, seems low for the Texas facilities (13 for Jewett, 2 for Odessa) in comparison to the Illinois facilities (2 for Mattoon, 3 for Tuscola), considering the long history of oil and gas exploration in Texas (especially near Jewett) versus none known for the two Illinois sites.

G8-9 15. There should be discussion of the potential for odor issues, at minimum in the uncertainty section, and possibly in a separate section using the Level of Distinct Odor Awareness of 0.01 ppm developed by the Acute Exposure Guideline Levels Committee as the basis for a quantitative assessment.

G8-11 16. On page 4-21, delete the second "are expected" from the next-to-last line of the last full paragraph.

G8-12 17. On page 4-27, change 0.051 ppmv to 0.51 ppmv in the 11th line of the next-to-last paragraph.

G9-13 18. On page 5-24, change "poorly abandoned wells" to "undocumented wells" in the first line of Section 5.3.4.3, to be consistent with the title of this section.

G9-16 19. "Significant amounts of air emissions (especially SO2) from the FutureGen Project are expected to occur during the unplanned restarts, as a result of plant upset when the plant exhaust is being vented to the atmosphere. These unplanned restart emissions would occur for short durations and could result in exceedance of short-term 3-hour SO2 Prevention of Significant Deterioration (PSD) increments at the Mattoon, Tuscola, and Odessa sites and short-term 3-hour and 24-hour SO2 PSD increments at the Jewett Site. However, the probabilities of such exceedance are very low . . . Emissions from normal operation of the FutureGen Power Plant would not exceed the PSD increments for any of the criteria pollutants."

Comment: The Prevention of Significant Deterioration (PSD) regulations do not provide an exemption to meeting the SO2 PSD increments on the basis of "unplanned restarts", or planned restarts, for that matter. For the short-term averaging periods (3-hour, 24-hour), modeling results must show that the applicable PSD increment level (concentration) will not be exceeded more than once a year for a given receptor location.

G9. Illinois EPA (Reed, Michael T.)

G9-17

20. On page 4.2-3, Section 4.2.2.1, paragraph 3: You indicate that the closest non-attainment area (NAA) to the proposed Mattoon Power Plant and Sequestration site is Indianapolis, Indiana. Information originally provided by IEPA for Section 4.2 indicates that the closest NAA to Mattoon, IL is St. Louis, MO-IL which is approximately 72.3 miles from the proposed site. The closest maintenance area (MA) and distance indicated in the EIS is correct for Vigo County, IN.

G9-18

21. On page 5.2-3, Section 5.2.2.1, paragraph 3: You indicate that the closest non-attainment area location to Tuscola, IL is Indianapolis, Indiana. This location is correct however, the distance appears to be in error. IEPA had originally provided information indicating that the distance to the nearest nonattainment area (O_3) is 86.3 miles verses 152 miles which is stated in the EIS document.

G9-19

22. In Volume 1, Section 2.5.6.1, page 2-61, it states: "Although the FutureGen Project is being developed to be the first near-zero-emissions coal power plant, low levels of air emissions would be generated by process units such as the gasifier, combustion turbines, and the cooling tower."

Comment: The FutureGen Project triggers review under the Prevention of Significant Deterioration (PSD) regulations because it will exceed the "major source thresholds of 100 tons per year" for four pollutants (SO2, NO2, PM10, and CO) based upon estimated initial startup emissions for 2012. This is not a "near-zero-emissions" facility, even though touted as such, and serious consideration should be given to removing occurrence of this "near-zero-emissions" language in the EIS.

G9-20

23. In Volume 1, Section 3.1.2, page 3-1, it states: "Impacts related to visibility, regional haze, and nitrogen and sulfur deposition in Class I areas were also considered. DOE also reviewed the applicability of air regulations and regional air quality plans and the potential for impacts from vapor plumes and odors."

Comment: The EIS provides virtually nothing in the way of quantitative estimates of odor impacts (for any averaging time). If odor modeling was performed based upon all sources (flare, fugitives, and stack releases)---rather than a hypothetical single source (HRSG stack) as used for the criteria pollutant modeling---and upon instantaneous impacts (3-5 seconds, the length of time to take a breath of air), would the modeling results support the claim that "odors of hydrogen sulfide (H2S) and ammonia are expected to be limited to within the facility boundary (p. 3-4)?

G9-21

24. In the Summary, Section S.6.5.2, page S-49: "Associated with . . . unplanned restarts are short-term increases to facility emissions due to the need to flare process gases for a short period . . ."

Comment: Flare releases are not modeled the same as traditional "smokestack" releases. Since "unplanned restarts" result in significant SO2 emissions from the flare, what would be the likely change in modeling results (NAAQS and PSD increment) if flare emissions were truly modeled as a flare following USEPA modeling guidance rather than as the hypothetical HRSG stack emissions?

G9. Illinois EPA (Reed, Michael T.)

G9-22

25. In the Summary, Section S.6.5.3: Antiscalants, biocides and other chemicals will be used in the process water, cooling tower water, etc.

Comment: Have these chemicals been evaluated for their potential impact to local biota from cooling water drift air emissions, or any other potential air emission sources?

G9. Illinois EPA (Reed, Michael T.)

Response to Comment #1:

DOE added the following text to Sections 4.2.3.2; 5.2.3.2; 6.2.3.2; and 7.2.3.2 under the discussion of local plume visibility:

"Evaporated water would be pure water, although water droplets carried with the exhaust air (called drift) would have the same concentration of impurities as the water entering and circulating through the tower. Water treatment additives could contain anti-corrosion, anti-scaling, anti-fouling and biocidal additives which can create emissions of VOCs, particulate matter, and toxic compounds. The drift is not expected to cause excessive pitting or corrosion of metal on nearby structures or equipment due to the relatively small amount of water released and the presence of trace amounts of anti-corrosion additives. Similarly, the treatment additives would not be expected to cause adverse impacts to local biota due to the very small amounts that would be released.

However, as a best management practice, the drift rate and associated deposition of solids could be reduced by employing baffle-like devices, called drift eliminators."

Response to Comment #2:

DOE concurs and the citation of IL regulations in Table C.1-2 has been corrected.

Response to Comment #3:

DOE concurs and the citation 35 IAC 270 for the Clean Air Act Permit Program was added to Table C.1-2.

Response to Comment #4:

The discussions focus on the Clean Air Mercury Rule. 40 CFR Part 63 is already cited in the table under the NESHAP discussing the HAPs. The citation 35 IAC 232 was added to Table C.1-2.

Response to Comment #5:

DOE does not believe that 40 CFR 60 Subpart VV "Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry" would be applicable to the FutureGen facility. Subpart VV applies to facilities designated as in the Synthetic Organic Chemicals Manufacturing Industry. DOE understands that the provisions of Subpart KKKK "Standards of Performance for Stationary Combustion Turbines" may be applicable to the project if the exemptions presented in §60.4310 are not appropriate. A final applicability analysis for the facility will be completed in concurrence with the final design for the facility. No change was made to the EIS.

Response to Comment #6:

DOE concurs and has revised the reference presented on in Table C.1-2. A citation to IL regulations has been provided in the table.

Response to Comment #7:

Because the EIS is not meant to be a permit application and is based upon conceptual design information, a complete applicability determination for all of the regulatory requirements has not been made. It is anticipated that such a determination will be included in the permit application for the facility. The text will remain as presented in the EIS.

G9. Illinois EPA (Reed, Michael T.)

Response to Comment #8:	Because the EIS is not meant to be a permit application and is based upon conceptual design information, a complete applicability determination for all of the regulatory requirements has not been made. It is anticipated that such a determination will be included in the permit application for the facility. The text will remain as presented in the EIS.
Response to Comment #9:	CO requirements specific to boilers have not been considered in this EIS because the EIS is not meant to be a permit application. Additionally, because of the fact that the FutureGen Project design is in a conceptual stage, information on the specific equipment that would be used is not yet available. After the site is selected and the facility design is completed, the applicability of regulations specific to each component will be reviewed as part of the air permitting process. The text will remain as presented in the EIS.
Response to Comment #10:	Because the EIS is not meant to be a permit application and is based upon conceptual design information, a complete applicability determination for all of the regulatory requirements has not been made. It is anticipated that such a determination will be included in the permit application for the facility. The text will remain as presented in the EIS.
Response to Comment #11:	H_2S is expected to diffuse in the subsurface and to react with the rock formations during upward migration, which would minimize or eliminate releases to the atmosphere, as described for potential human exposures. Accordingly, H_2S is not likely to migrate upward into shallow soils where burrowing animals could be present. In addition, toxicity data for comparing soil gas to H_2S concentrations are not available. Text was added to the Biological Resources Sections 4.9.3.2; 5.9.3.2; 6.9.3.2; and 7.9.3.2 under Operational Impacts as follows: "If there were upward migration of the sequestered gas, the H_2S within the gas would diffuse in the subsurface, which would minimize or eliminate its release to the atmosphere. Subsequently, migration of H_2S into shallow soils at concentrations harmful to burrowing animals and other ecological receptors is not likely."
Response to Comment #12:	A statement was included in Section 6.3 of the Risk Assessment explaining that the ecological risks were conducted at a screening level due to the lack of site-specific information on biota. In addition, toxicity data for assessing ecological risks from H_2S concentrations are not available, except for the freshwater aquatic criteria provided in Table 3-8 of the Risk Assessment. Consideration of ecological effects could be used to help design appropriate monitoring of the FutureGen facilities to obtain soil gas measurements of CO_2 and H_2S in the shallow subsurface environment (assuming toxicological data for H_2S effects on biota are determined in the future).

G9. Illinois EPA (Reed, Michael T.)

Response to Comment #13:

There are five mature oil fields within a 10-mile radius of the Mattoon Site. The Tuscola injection site is within a part of the Cooks Mills Consolidated Oil Field and a gas storage field is nearby. There are existing wells within the subsurface ROI at both Mattoon and Tuscola, as shown in Figure 2-14 for Mattoon and Figure 2-17 for Tuscola of the Risk Assessment. Jewett has two injection sites both located near oil and gas production areas (see Figure 2-8 in the Risk Assessment), so a larger number of undocumented wells was used at this site. The injection site at Odessa has fewer nearby wells than Jewett; as seen in Figure 2-11 of the Risk Assessment, of which two were within the subsurface ROI for one of the injection wells. A detailed survey to identify abandoned or unknown wells is planned at the selected FutureGen site; any wells found would be properly sealed.

The change "poorly abandoned wells" to "undocumented wells" was made in the first line of Section 5.3.4.3, to be consistent with the title of this section and was added to the revised Risk Assessment.

Response to Comment #14:

Monitoring and alarm systems for gas releases are discussed in the Health and Safety sections of the EIS. While specific inhalation pathways are not presented (because the power plant design is not complete), it is acknowledged that certain catastrophic events (such as fire or explosion) would result in death for on-site workers. Section S.11, Table S-16 and Section 3.4, Table 3-13 have been amended to add the use of indoor monitoring and warning devices as a method to mitigate impacts to facility workers.

Response to Comment #15:

The section on regulations in the EIS serves to provide an overview of the major types of regulations that may be applicable to a power plant and that drive major issues related to the operations in the power plant and its potential impact on the environment. Regulations specific to a particular pollutant or equipment are typically of concern during the permitting process, when determining the types of control and standards. Additionally, the State agency may allow for variance from a specific regulation as part of the issuance of the permit. Therefore, discussions of every specific regulation are not practical at this time.

Response to Comment #16:

The emissions and predicted concentrations presented in the EIS are based upon a conservative "emission envelope", which was estimated using the worst-case operating scenarios and multiple designs cases. Understanding that the PSD regulations do not exempt exceedances of the PSD increment under any condition and the fact that the FutureGen Project is in a conceptual stage of design, the EIS attempts to show that statistically, based on the worst-case and conservative estimates, the probability of emissions from the plant exceeding the PSD increment are low to none. This approach is used to help site selection for the power plant. Once a site is selected and the FutureGen Project design is complete, the issue of SO_2 emissions and associated PSD increment would be assessed further as part of the air permit application process. The text will remain as presented in the EIS.

Response to Comment #17:

The text in Section 4.2.2.1 has been revised as follows: "The nearest non-attainment and maintenance areas are located in St. Louis, MO-IL (72.3 miles [116.3 kilometers] away)…."

G9. Illinois EPA (Reed, Michael T.)

Response to Comment #18:	The text in Section 5.2.2.1 has been revised to indicate that Indianapolis, Indiana is 86.3 miles (138.9 kilometers) from the proposed Tuscola Power Plant Site.
Response to Comment #19:	The term "near-zero emissions" is used only in connection with the underlying purpose and need for the project and DOE acknowledges that the project, while still emitting very low pollutants compared to other coal-powered electric plants, would still be a major air pollution source as defined by the Clean Air Act, as stated in the Air Quality sections of the EIS (4.2, 5.2, 6.2 and 7.2).
Response to Comment #20:	Assumptions about the types of odors that would be released from the FutureGen Project and the conclusion that the odors would be limited to the facility boundaries are based on a similar situation at an existing power plant (Wabash River Coal Gasification Repowering Project, Terre Haute, Indiana: a 262 MWe commercial scale integrated gasification combined cycle [IGCC] power plant – see www.fossil.energy.gov/programs/powersystems/publications/Clean_Coal_Topical_Reports/topical20.pdf for an overview) and information in an EIS for a proposed (and permitted) power plant (Orlando Gasification Project, Orlando, Florida: a 285 MWe commercial scale IGCC power plant – see www.netl.doe/gov/technologies/coalpower/cctc/EIS/orlando_pdf/FrontMatter%20FINAL%20revised%2011207.pdf for an overview). This approach of both referencing an existing IGCC power plant and referencing the EIS for another proposed IGCC power plant is sufficient here where we are at the site selection stage and the design work and equipment selection is not yet available to support more detailed analyses. Once a site is selected and the FutureGen Project design is complete, the issue of odor releases and associated concentrations could be addressed further as part of the air permit application process. The text will remain as presented in the EIS.
Response to Comment #21:	Flare releases could not be modeled with any greater accuracy because of the lack of information at the current preliminary/conceptual design of the FutureGen Project. To get a sense of the concentration of pollutants from the FutureGen Project, the DOE and the Alliance assume a scenario where all the emissions would be released from a single source (i.e., the HRSG) and that unplanned restarts would contribute the most emissions as would be the case of flaring events. The emissions and predicted concentrations presented in the EIS are based upon a conservative "emissions envelope", which was estimated using the worst-case operating scenarios (i.e., multiple unplanned restart events) and multiple designs cases. This approach is used to help in achieving an important goal of the EIS, which is site selection for the project. Once a site is selected and the FutureGen Project design is complete, the issue of pollutants specific to flare releases and associated concentrations would be addressed further as part of the air permit application process. Therefore, the text will remain as presented in the EIS.

G9. Illinois EPA (Reed, Michael T.)

Response to Comment #22

The following text has been added to Sections 4.2.3.2; 5.2.3.2; 6.2.3.2; and 7.2.3.2 under the discussion of local plume visibility:

"Evaporated water would be pure water, although water droplets carried with the exhaust air (called drift) would have the same concentration of impurities as the water entering and circulating through the tower. Water treatment additives could contain anti-corrosion, anti-scaling, anti-fouling and biocidal additives which can create emissions of VOCs, particulate matter, and toxic compounds. The drift is not expected to cause excessive pitting or corrosion of metal on nearby structures or equipment due to the relatively small amount of water released and the presence of trace amounts of anti-corrosion additives. Similarly, the treatment additives are not expected to cause noticeable adverse impacts to local biota due to the very small amounts released."

However, as a best management practice, the drift rate and associated deposition of solids could be reduced by employing baffle-like devices, called drift eliminators."

G10. FutureGen Texas Team (Walden, Steven – Walden Consulting)

Summary

J19-1 The description incorrectly states that the proposed Jewett plant site is bordered by U.S. Highway 79 (US 79). Please revise the paragraph to indicate the plant site is bordered only by Farm-to-Market (FM) Road 39.

J19-2 In Table S-3, the description indicates that the proposed Jewett injection site is located approximately 16 miles east of Fairfield in Freestone County. Please revise the description to also include the proposed injection site on the TDCJ property in Anderson County.

O53-2 The last entry in Table S-4 on this page mentions that the proposed injection targets are a "lower interval of the Delaware Mountain Group sandstones and an upper interval of Queen formation sandstones." This is ambiguous and could be misconstrued. Please clarify that the lower target is the Delaware Mountain Group (not a lower interval of the DMG) and the upper target is the lower part of the Queen Formation.

O53-3 In Table S-4, the description incorrectly states that the proposed sequestration site for the Odessa site is "3 miles (4.8 kilometers) east of Fort Stockton." Please revise the description to state that the outer boundary of the injection reservoir area is more than 8 miles (12.9 kilometers) east of Fort Stockton, and the actual injection sites will be farther.

TX5-1 In Figure S-14, the number of injection wells and plumes shown (10) doesn't match injection scenario mentioned in summary (at least 3 or 8 wells, depending on injection rate). Please clarify the discrepancies.

TX5-2 **TCEQ -** In Table S-12, regarding Air Quality – Modeling results suggest a relatively higher probability of exceedances of the SO2 PSD increments and Annual PM2.5 levels that approach the NAAQS at the Jewett site. These are higher than would be expected for the rural East Texas area. The ambient air quality data used for this analysis, described in Appendix E, indicates that all monitors are located in highly urbanized areas not representative of the Jewett area. Please consider the following recommended monitoring locations as more representative alternatives for the Jewett site: Kaufman (SO2, NOx, O3 and PM2.5) - 80 mi.- would probably be the most representative and could replace Dallas North; Fayette County (SO2, NOx, O3 and PM2.5) - 100 mi - would be good second choice and probably should be used instead of Aldine; Tyler Airport (NOx and O3) would also be acceptable; Alabama Coushatta (O3) - 90 mi. - but it has limited use do to the limited number of parameters measured.

TX5-3 **TCEQ -** In Table S-12 regarding Air Quality – The Table lists predicted concentrations from each of the four sites, and Tables E-17 and E-18 of Appendix E list the same information for Jewett and Odessa, respectively, with additional information included as footnotes to the tables. For Jewett, the 3-hr concentration is noted to be the 618th maximum concentration, and the 24-hr concentration is noted to be the 88th maximum concentration. Probabilities of exceeding the short-term SO_2 increment (both 3-hr and 24-hr) are also presented with the listed concentrations. The same approach with different ranked concentrations is also presented for Odessa (33rd maximum concentration for the 3-hr concentration). Please clarify the rationale for selecting the predicted concentrations listed for the SO_2 plant upset scenarios.

J19-3 In Table S-12, regarding Physiography and Soils - Up to 73 acres within the Jewett power plant site are reportedly to be disturbed for transportation corridor infrastructure construction. This is almost 5 times more than at any other site and over 40 times higher than at the Odessa site. Please provide an explanation why this site is different from the other candidate sites or revise the estimate.

G10. FutureGen Texas Team (Walden, Steven – Walden Consulting)

O53-4 In Table S-12, regarding Surface Water – The DEIS indicates that anticipated pipeline construction for the Odessa site will require approximately 3 to 6 stream crossings. No perennial streams exist within any of the proposed corridors for this site, and only a limited number of ephemeral draws could potentially be impacted by construction. There will be no CO2 pipeline crossings of perennial streams, except potentially along the ROW for the existing commercial CO2 pipeline from the plant site to the sequestration site. Please revise the description to distinguish between perennial stream crossings and intermittent or ephemeral stream crossings and if these occur within existing or new ROW.

O53-5 In Table S-12 regarding Biological Resources – The DEIS incorrectly suggests that primarily row crops would be lost to any new corridor construction for the Odessa site. Please revise the description to indicate that the affected area is primarily non-arable, brush lands.

J19-4 In Table S-12, regarding Biological Resources – The DEIS indicates that up to 63 miles of "high quality deer and turkey hunting ground" would be lost to utility corridor construction at the Jewett site. Please revise the description to clarify that pipeline construction is common in this area and would result in little or no long-term impact on hunting resources.

TX5-4 Incomplete and Unavailable Information – The DEIS incorrectly suggests that the disposition of the wastewater from the on-site sanitary wastewater treatment plants for the Jewett and Odessa sites is undetermined. Please revise the information to clarify that the on-site wastewater systems will be designed according to standard industry practice to ensure that no discharge occurs.

J19-5 Table S-14 includes proposed power plants that are no longer being considered. Please remove references to Big Brown 3, Tradinghouse 3 & 4, and Lake Creek 3 power plants.

J19-6 Potential Cumulative Impacts for Alternative Sites (Jewett) – The DEIS states that Texas is continuing to work on the restoration of the Trinity River. While this is true, the segments of the Trinity River near the proposed Jewett plant and sequestration sites are not currently listed as impaired for any water quality standards. Please revise the description to clarify that this portion of the Trinity River is not impaired.

J19-7 Volume I

Under Table 2-3, the "Feature Heading: Sequestration site….", the DEIS fails to identify the secondary seal provided by the Midway Group. Please correct sentences to read: "Both the Woodbine and Travis Peak formations lie beneath a primary seal, the Eagle Ford Shale, which has a thickness of 400 feet (122 meters) and shales of the Midway Group secondary seal, which has a thickness of 700 feet (215 meters)…. There are also over 0.4 mile (0.6 kilometer) of low permeability carbonates and shales, including the Midway Group secondary seal, above the Eagle Ford that create additional protection for shallow drinking water aquifers."

J19-8 The description incorrectly states that the proposed Jewett plant site is bordered by U.S. Highway 79 (US 79). Please revise the paragraph to indicate the plant site is bordered only by Farm-to-Market (FM) Road 39.

J19-9 In Table 2-3, regarding Jewett Site Descriptions – Same comments as identified in SUMMARY, Table S-3.

O53-6 The last entry in Table 2.4 on this page mentions that the proposed injection targets are a "lower interval of the Delaware Mountain Group sandstones and an upper interval of Queen formation sandstones." This is ambiguous and could be misconstrued. Please clarify that the lower target is the Delaware Mountain Group (not a lower interval of the DMG) and the upper target is the lower part of the Queen Formation.

G10. FutureGen Texas Team (Walden, Steven – Walden Consulting)

O53-7 In Table 2-4, regarding Odessa Site Description – Same comments as identified in SUMMARY, Table S-4.

O53-8 In Figure 2.14, the number of injection wells and plumes shown (10) doesn't match any injection scenario. Please clarify the discrepancies.

#1 **TCEQ -** Under the heading, "Annual Monitoring Methods section," the DEIS incorrectly describes the LiDAR technology. Please correct sentence to read "LiDAR is an aerial technique that uses laser pulse travel times from aircraft to land surface…."

TX5-6 In Table 3-3, regarding Summary Comparison of Impacts – Same comments as Table S-12 in SUMMARY

TX5-7 **TCEQ -** Air Quality – The DEIS indicates that "Air modeling was conducted to assess the potential for impacts to ambient air quality conditions at each site from operating the proposed power plant. Because local air quality monitoring data were not available for any of the alternative sites, monitoring data from the closest attainment area to each site were used as a surrogate data for the local background ambient air quality." Information regarding the ambient air data provided in Appendix E indicates that all of the monitoring stations are located in urban areas which are not representative of the rural plant sites in Texas. The Draft EIS then misuses the "high ambient concentrations" taken from the urban background monitors and states that the $PM_{2.5}$ NAAQS would be approached at the proposed FutureGen sites. Please revise the Draft EIS to clarify how unlikely this scenario would be considering the very conservative estimates of ambient background concentrations. Please consider the following recommended monitoring locations as more representative alternatives for the Jewett site: Kaufman (SO2, NOx, O3 and PM2.5) - 80 mi.- would probably be the most representative and could replace Dallas North; Fayette County (SO2, NOx, O3 and PM2.5) - 100 mi - would be good second choice and probably should be used instead of Aldine; Tyler Airport (NOx and O3) would also be acceptable; Alabama Coushatta (O3) - 90 mi. - but it has limited use do to the limited number of parameters measured. Also, please consider the following recommended monitoring locations as more representative alternatives for the Odessa site: Although Odessa and Hobbs NM sites are good choices, El Paso is not. Other sites that might be used are Carlsbad NM (NOx, O3 and PM2.5) - 110 mi, Artesia NM (SO2 and NOx) -130 mi., Lawton OK (O3) - 300 mi, and Big Bend (O3 and PM2.5) - 200 mi.

O53-9 On the last bulleted item on the page, the EIS mentions Lower Delaware Mountain Group and upper interval of Queen formation. Please clarify that the lower target is the Delaware Mountain Group (not a lower interval of the DMG) and the upper target is the lower part of the Queen Formation.

J19-10 Physiography and Soils – The DEIS suggests that up to 73 acres within the Jewett power plant site are reportedly to be disturbed for transportation corridor infrastructure construction. This is almost 5 times more than at any other site and over 40 times higher than at the Odessa site. Please provide an explanation why this site is different from the other candidate sites or revise the estimate.

#2 Surface Water – The DEIS describes the actions to be taken to control non-point pollution during normal operations. Please revise this section to specify the requirement to obtain a Multi-Sector General Permit for industrial storm water control during post-construction operations.

O53-10 Surface Water – The DEIS suggests that the "…Odessa sites would include underground crossings of surface waters by CO2 pipelines. In the unlikely event of a CO2 pipeline leak near one of these crossings, surface water impacts could include a reduction in pH and localized high concentrations of CO2 and H2S." There will be no CO2 pipeline crossings of perennial streams, except potentially along the ROW for the existing commercial CO2 pipeline from the plant site to the sequestration site. Please revise the description to distinguish between perennial stream crossings and intermittent or ephemeral stream crossings and if these occur within existing or new ROW.

G10. FutureGen Texas Team (Walden, Steven – Walden Consulting)

O53-11 The target sequestration formation shown as "Lower Delaware Mountain Group and upper interval of the Queen Formation" is incorrect. Please clarify that these should be Delaware Mountain Group (primary) and Lower Queen Formation (secondary)

J19-11 Table 3-7 includes proposed power plants that are no longer being considered. Please remove references to Big Brown 3, Tradinghouse 3 & 4, and Lake Creek 3 power plants.

J19-12 **TCEQ -** Potential Cumulative Impacts for Alternative Sites (Jewett) – The characterization of the potential for new sources near the proposed Jewett power plant site implies a greater level of certainty than may actually exist. Please revise the DEIS to read, "As listed in Table 3-7, there are five coal-fueled power plants within a 50-mile (80.5-kilometer) radius of the proposed Jewett Power Plant Site in various stages of planning and permitting. In addition, the NRG Limestone Electric Generating Station plans to add a lignite-fired boiler and 800-MW electric generating unit. Based on planning data, all of these plants could begin operation before the completion of the FutureGen Project."

J19-13 **TCEQ -** Potential Cumulative Impacts for Alternative Sites (Jewett) – The DEIS suggests that a cumulative air quality impact analysis would largely be driven by the combined emissions of the proposed facilities listed in Table 3-12 (proposed coal fired power plants near Jewett). If a full impacts analysis is required, it will be pollutant specific, and the Area of Impact (AOI) will be defined from the project modeling. The emission inventory for the cumulative modeling analysis may include additional sources other than just the proposed coal fired power plant listed in Table 3-12. Please revise the description to indicate that the project modeling analysis will evaluate all sources of applicable pollutants within the AOI.

J19-14 Table 3-12 includes data for proposed power plant that are no longer being considered. Please remove references to Big Brown 3, Tradinghouse 3 & 4, and Lake Creek 3 power plants.

J19-15 **TCEQ -** Potential Cumulative Impacts for Alternative Sites (Jewett) – The DEIS incorrectly implies that the emissions from new sources will necessarily result in adverse air quality impacts. Permit requirements should effectively prevent adverse air quality impacts from new sources. Please revise the description to read, "Table 3-12 summarizes the air emissions estimated for these proposed power plants. Should the projects go forward, they would release tens of thousands of tons of criteria pollutants into the atmosphere."

J19-16 **TCEQ -** Potential Cumulative Impacts for Alternative Sites (Jewett) – The DEIS suggests that ambient concentrations of $PM_{2.5}$ are much closer to the NAAQS. There is no ambient monitoring data in the Jewett area to support this statement. The Draft EIS misuses the "high ambient concentrations" taken from the urban background monitors (Houston) and states that the $PM_{2.5}$ NAAQS would be approached at the proposed FutureGen sites. Please revise the description to read, "Cumulative air emission from proposed facilities in the region would likely cause the $PM_{2.5}$ concentrations to increase.

J19-17 **TCEQ -** Potential Cumulative Impacts for Alternative Sites (Jewett) – The DEIS incorrectly implies that the emissions from other proposed sources are expected to consume remaining PSD increments. Please revise the description to read, "While the FutureGen Project would emit pollutants, the levels would be very small, and future air quality degradation in the region would be dominated by the other proposed power plants. The State has evaluated these projects and has determined that emissions increases in the ROI would not cause or contribute to a condition of air pollution.

O53-12 Table 3-13 incorrectly indicates that "Some surface water use would occur in Odessa, Jewett, and Tuscola. Impacts of water use are likely to be more important for the Odessa Site." No surface water will be used for either the Jewett or Odessa sites. Please revise the table to remove references to Jewett and Odessa surface water use.

G10. FutureGen Texas Team (Walden, Steven – Walden Consulting)

#3	In Table C.1-2, regarding State and Federal Regulatory and Permitting Requirements – Table C.1-2 incorrectly cites 30 TAC 122 as the applicable state rule that would require compliance with New Source Performance Standards (NSPS). Please revise the table to indicate that conformance with NSPS is required during New Source Review under 30 TAC 116.
#4	In Table C.1-2 regarding State and Federal Regulatory and Permitting Requirements – Table C.1-2 incorrectly cites 30 TAC 113 as the applicable state rule that would require compliance with the National Emissions Standards for Hazardous Air Pollutants (NESHAP). Please revise the table to indicate that conformance with NESHAP is required during New Source Review under 30 TAC 116.
#5	In Table C.1-3 regarding State and Federal Regulatory and Permitting Requirements – Table C.1-3 incorrectly cites 30 TAC 106 as the applicable state rule that would require an Air Construction Permit if a federal PSD permit is not necessary. Please revise the table to indicate that State New Source Review requirements are covered by 30 TAC 116, although 30 TAC 106 is referenced regarding General Permit requirements.
TX5-8	In Table C.1-3 regarding State and Federal Regulatory and Permitting Requirements – Table C.1-3 incorrectly indicates that 30 TAC 122 would require a state Air Operating Permit to be issued to a minor source if it is determined that a Title V operating permit under the federal CAA would not be required. Please revise the table to clarify that while 30 TAC 122 codifies the Texas rules necessary to implement the delegated federal Title V program, Texas has not established any additional state operating permit requirements not mandated by federal statute.
TX5-9	In Table C.1-3 regarding State and Federal Regulatory and Permitting Requirements – Table C 1-3 cites requirements for a Hydrostatic Test Discharge Permit for Texas but does not include any similar requirement for Illinois. Please revise the table to show comparable regulatory information for both states, as applicable.
TX5-10	In Table C.1-3 regarding State and Federal Regulatory and Permitting Requirements – Upon delegation of the NPDES program, Texas adopted the Texas Pollution Discharge Elimination System (TPDES) program. Please revise the table to reference TPDES, rather than NPDES, requirements.
TX5-11	In Table C.1-3 regarding State and Federal Regulatory and Permitting Requirements – Table C 1-3, in reference to Solid Waste Management, On-Site Disposal of Nonhazardous Industrial Solid Waste (30 TAC Ch. 335), inappropriately describes requirements for the permitting of hazardous waste disposal. The disposal or treatment of hazardous waste is not anticipated on the FutureGen site, and associated permitting should not be applicable. Please revise the table to clarify that on-site disposal of nonhazardous waste does not require a permit in Texas.
TX5-12	**RRC -** In Table C.1-3 regarding State and Federal Regulatory and Permitting Requirements – Table C 1-3, in reference to Underground Injection Control Permit includes typographical errors. Please revise the table to change “Texas Council on Environmental Quality” to “Texas Commission on Environmental Quality” and the term “projective” of oil, gas or geothermal resources in the second sentence to “productive.”
#6	Risk Assessment Methodology – The appendix does not include a description of the methodologies or assumptions used to assess the Total Cancer Risk and Total Hazard Coefficient. Please revise the appendix to describe these methodologies.

G10. FutureGen Texas Team (Walden, Steven – Walden Consulting)

TX5-13

TCEQ - Air Modeling Protocol – The appendix notes that the TCEQ pre-processed AERMET data are required in AERMOD modeling analyses. These AERMET pre-processed data are not required. The meteorology used for Texas is conservative screening meteorology--predicted concentrations, particularly long-term averages, will be higher than would be expected if more refined surface roughness length values were used. An applicant can always run AERMET with the proper technical justification for representative selections of Albedo, Bowen Ratio, and surface roughness length in AERMET.

Please revise the following text in section E.3.2.1:

"The Texas Commission on Environmental Quality's (TCEQ) ~~Emissions Banking~~ Air Dispersion Modeling Team (ADMT) ~~(EBMT)~~ has prepared AERMOD meteorological data sets that ~~are required to~~ can be used for air dispersion modeling in the state of Texas."

"The preprocessed meteorological data sets provided by TCEQ incorporate conservative ~~appropriate~~ values of the above three surface characteristics."

J19-18

TCEQ - In Table E-8 regarding Air Modeling Protocol – The appendix lists the Jewett Land Use Characterization by season. The "winter" table is incomplete (only lists sectors 1,2,5,6 out of a total of 12 sectors). Please revise this table to include all sectors or explain the discrepancy.

O53-13

TCEQ - In Table E-9 regarding Air Modeling Protocol – In Table E-9 for Odessa, the "annual" table lists an average Bowen Ratio value that does not seem consistent with the 12 sector average values. Please revise the table to correct the annual average Bowen Ratio value.

J19-19

TCEQ - Air Modeling Protocol – The DEIS lists "The nearest ambient monitors to the site and the pollutants monitored at these locations …" and indicates that "The stations selected are in proximity to the Jewett site." It further includes Table E-11 which "presents the representative yet conservative background for these criteria pollutants for the proposed Jewett site." Please consider the following recommended monitoring locations as more representative alternatives for the Jewett site: Kaufman (SO2, NOx, O3 and PM2.5) - 80 mi.- would probably be the most representative and could replace Dallas North; Fayette County (SO2, NOx, O3 and PM2.5) - 100 mi - would be good second choice and probably should be used instead of Aldine; Tyler Airport (NOx and O3) would also be acceptable; Alabama Coushatta (O3) - 90 mi. - but it has limited use do to the limited number of parameters measured.

J19-20

TCEQ - In Table E-11 regarding Air Modeling Protocol – The appendix lists background ambient air quality for Jewett which is not consistent with the corresponding table in Volume 2, Table 6.2-2. Please revise this information to be consistent or explain the discrepancies.

O53-14

TCEQ - Air Modeling Protocol - The DEIS lists "The nearest ambient monitors to the site and the pollutants monitored at these locations …" and indicates that "The stations selected are in proximity to the Odessa site." It further includes Table E-12 which "presents the representative yet conservative background for these criteria pollutants for the proposed Odessa site." Please consider the following recommended monitoring locations as more representative alternatives for the Odessa site: Although Odessa and Hobbs NM sites are good choices, El Paso is not. Other sites that might be used are Carlsbad NM (NOx, O3 and PM2.5) -110 mi, Artesia NM (SO2 and NOx) -130 mi., Lawton OK (O3) - 300 mi, and Big Bend (O3 and PM2.5) - 200 mi.

O53-15

TCEQ - In Table E-12 regarding Air Modeling Protocol – The appendix lists background ambient air quality Odessa which is not consistent with the corresponding table in Volume 2, Table 7.2-2. Please revise this information to be consistent or explain the discrepancies.

G10. FutureGen Texas Team (Walden, Steven – Walden Consulting)

Volume II

J19-21 The DEIS incorrectly cites table references. Please correct second sentence to read "Key features of the Jewett Site are listed in Table 6.1-1."

J19-22 The DEIS incorrectly cites table and figure references. Please correct last sentence to read "Following Table 6.1-1, Figures 6.1-1, 6.1-2, and 6.1-3 illustrate…"

J19-23 Table 6.1-1, under "Feature Heading: Sequestration site….", fails to identify the secondary seal provided by the Midway Group. Please correct sentences to read: "Both the Woodbine and Travis Peak formations lie beneath a primary seal, the Eagle Ford Shale, which has a thickness of 400 feet (122 meters) and shales of the Midway Group secondary seal, which has a thickness of 700 feet (215 meters)…..There are also over 0.4 mile (0.6 kilometer) of low permeability carbonates and shales, including the Midway Group secondary seal, above the Eagle Ford that create additional protection for shallow drinking water aquifers."

J19-24 The description incorrectly states that the proposed Jewett plant site is bordered by U.S. Highway 79 (US 79). Please revise the paragraph to indicate the plant site is bordered only by Farm-to-Market (FM) Road 39.

J19-25 In Table 6.1-1 regarding Jewett Site Features – Same comments as shown for Summary, Table S-3

J19-26 **TCEQ -** Operational Impacts – The DEIS notes an amount of annual mercury predicted by AERMOD to be deposited and within a certain distance from the project site. However, given the units presented, this seems to be the annual ground-level concentration predicted by AERMOD. Please revise these statements to reflect "ground-level concentrations" rather than "deposition."

J19-27 The DEIS incorrectly indicates that the average annual precipitation at the Jewett site is "about 15 inches." Please revise the average annual precipitation to approximately 43 inches to more accurately reflect meteorological conditions in the area.

J19-28 In Table 6.3-1 regarding Seasonal Weather Data – The weather precipitation data in the table is incorrectly labeled. Please revise the table to clarify that this reflects "Average Monthly Precipitation" rather than "Precipitation."

J19-29 Figure 6.4-1, has been constructed using only those wells that were assigned API numbers by the Railroad Commission of Texas (RCT). BEG identified an additional category of oil and gas wells in the RCT database that have location coordinates, but which have not been assigned an API number. There are 11 non API-numbered wells (shapefile name: Wells_RRC_AreaofInterest_HOB, shp) located within the 50-Year (1.7 mile) radius circles around the three Jewett Site injection wells. Hence there are a total of 46 wells within the defined ROI.

Please note that figure 6.4-1 uses the number 35 for wells within the Jewett ROI, whereas all text in the EIS uses the number 57 for wells within the Jewett ROI. In both cases, the number of wells should be 38 for the Woodbine ROI and 46 for the combined Woodbine and Travis Peak ROI. Please locate this data entry error throughout the document and correct.

J19-30 The plume radius indicated in the legend of Figure 6.4-1 is inconsistent with Section 6.4.1.1 Region of Influence, where the ROI for subsurface is defined as: Numerical modeling indicates that the plume radius associated with injecting 2.8 million tons (2.5 MMT) per year for 20 years would be 1.7 miles (2.7 kilometers)…, Please correct the legend to read: "Jewett Sequestration Site 20-Yr plume at 2.5 MMT/year (1.7 Mile radius)"

J19-31 Figure 6.4-2, incorrectly characterizes the Midway Group. The 700 ft (215 meter) thick Midway Group is actually all marine shale except for 10-30 foot thick sands in the top 50-100 feet. Please show that this unit should be depicted as shale in the stratigraphic column shown in Figure 6.4-2.

G10. FutureGen Texas Team (Walden, Steven – Walden Consulting)

J19-32 Figure 6.4-2, fails to indicate that the Midway Group is a distinctly defined secondary seal or ultimate seal overlying the injection horizons and Eagle Ford primary seal. Please add blue shading on the right hand side of the figure corresponding to the Midway Group to show this as a seal.

J19-33 Figure 6.4-2 indicates that the drinking water aquifer extends down to depths of approximately 1,300 feet, which corresponds to the base of the Wilcox strata. The drinking water aquifer does not extend down in to strata of the Midway Group. Please correct this inconsistency.

J19-34 In Figure 6.4-2, under Explanation, incorrectly indicates that the information on the geologic column is mostly based on seismic profile of the Northern Injection Site. Please correct the "note" to read: "Note: Geologic column mostly based on a geophysical log of Well 42161316290000"

J19-35 The DEIS fails to identify the secondary seal provided by the Midway Group. Under the section heading: "Geological Resources in the Jewett Area," please correct the third paragraph to read: "The primary sequestration reservoir a the site is the Woodbine formation, which is overlain by the Eagle Ford shale primary seal occurring at a depth of approximately 0.8 mile (1.3 kilometers) below the ground surface. The Woodbine is also overlain by the Midway Group secondary seal occurring at a depth of approximately 0.25 mile (0.4 kilometer) below ground surface."

J19-36 Under section heading: "Geological Resources in the Jewett Area," third paragraph, please correct sentence to read: "It is reported that up to 46 known wells penetrate the Eagle Ford Shale that lie within the footprint of the 20-year 2.8 million tons (2.5 MMT) per year plume (radius of 1.7 miles [2.7 kilometers]) (FG Alliance, 2006c)."

J19-37 The DEIS fails to identify the secondary seal provided by the Midway Group. Under section heading Seals, Penetrations, and Faults, subsection heading Primary Seal, please correct sentence to read: "The primary caprock seal for the Jewett Sequestration Site is the Eagle Ford Shale."

J19-38 The DEIS incorrectly identifies the number of known wells that penetrate the primary seal. Under section heading Seals, Penetrations, and Faults, subsection heading Secondary Seals, second paragraph, please correct second sentence to read, "Thirty-eight wells that penetrate the primary seal are located within the maximum plume footprint of the two Woodbine CO_2 injection wells"

J19-39 The DEIS fails to identify the secondary seal provided by the Midway Group. Under section heading Seals, Penetrations, and Faults, subsection heading Secondary Seals, third paragraph, please add sentence to end of paragraph: "The ultimate seal at the Jewett Sequestration Site is provided by shales of the Midway Group secondary seal, which is 700 feet (215 meters) thick and lies below the base of the freshwater aquifer."

J19-40 The DEIS incorrectly identifies the number of known wells that penetrate the primary seal. Under section "Operational Impacts, subheading Sequestration Site," please correct last paragraph to read: "Forty-six wells are reported to penetrate the primary seal, the Eagle Ford Shale within the 20-Yr, 2.5 MMT per year ROI." Also, please delete the reference because number is incorrect in the FG Alliance (2006) document.

J19-41 Physiography and Soils, Transportation Corridors – The DEIS indicates that "Approximately 48 to 73 acres (19 to 30 hectares) of soil would be impacted by proposed road construction and improvements" at the Jewett site. Please provide an explanation why this site is different from the other candidate sites or revise the estimate.

O53-16 The second entry in Table 7.1-1 on this page mentions that the proposed injection targets are a "lower interval of the Delaware Mountain Group sandstones and an upper interval of Queen formation sandstones." This is ambiguous and could be misconstrued. Please clarify that the lower target is the Delaware Mountain Group (not a lower interval of the DMG) and the upper target is the lower part of the Queen Formation."

G10. FutureGen Texas Team (Walden, Steven – Walden Consulting)

O53-17 In Table 7.1-1 regarding Odessa Site Features – Same comments as shown for Summary, Table S-4

O53-18 In Figure 7.1-3, the number of injection wells and plumes shown (10) doesn't match any injection scenario. Please clarify discrepancies.

O53-19 Affected Environments – The DEIS incorrectly indicates "The proposed (Odessa) injection site is located … approximately 3 miles (4.8 kilometers) east of Fort Stockton." Please revise the description to clarify that the outer boundary of the injection reservoir area is actually more than 8 miles from Fort Stockton, and actual injection wells will be farther.

O53-20 **TCEQ -** Operational Impacts – The DEIS notes an amount of annual mercury predicted by AERMOD to be deposited and within a certain distance from the project site. However, given the units presented, this seems to be the annual ground-level concentration predicted by AERMOD. Please revise these statements to reflect "ground-level concentrations" rather than "deposition."

O53-21 The DEIS incorrectly indicates that the average annual precipitation at the Odessa site is "about 5 inches." Please revise the average annual precipitation to approximately 15 inches to more accurately reflect meteorological conditions in the area.

O53-22 In Table 7.3-1 regarding Seasonal Weather Data – The weather precipitation data in the table is incorrectly labeled. Please revise the table to clarify that this reflects "Average Monthly Precipitation" rather than "Precipitation."

O53-23 The meaning of "sandstone carbonate" in the third paragraph is unclear. Please clarify if this is referring to sandstones and carbonates (separate units) of the Trinity Group.

O53-24 The meaning of the statement "The depth interval of the injection reservoir for the lower Queen Formation is between approx. 0.5 to 1.0 mile for the Delaware Mountain Group." Is unclear. Please clarify statement.

O53-25 This section states that 4 wells are required for lower injection rate and 10 for higher; summary document says at least 3 wells are required for lower rate and at least 8 for higher rate. Please clarify this inconsistency.

O53-26 Wetlands – The DEIS states "No areas potentially subject to Section 404 jurisdiction are located within the CO2 pipeline corridor east or west of the proposed (Odessa) power plant site." However, only one CO2 pipeline is proposed to connect to the existing pipeline located east of the plant site. This Ector County pipeline segment should not be confused with the two pipeline corridors that have been proposed coming from existing CO2 pipelines east and west of the injection reservoir in Pecos County. Please revise the text to clarify this description.

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TX5-14 In Table 2-1 regarding Summary of Surface and Subsurface Features of Four Candidate Sites – The Climate data for the Jewett and Odessa sites, labeled as "Range of Seasonal Precipitation," is incorrect and actually reflects monthly seasonal averages. Please revise the table to reflect actual annual averages, comparable to the Illinois data, of approximately 42.6 inches for Jewett and 14.9 inches for Odessa.

TX5-42 In Table 2-1 regarding Summary of Surface and Subsurface Features of Four Candidate Sites – The Surface Water Resources information incorrectly identifies the lake near the Jewett site as "Lake Limonite." Please revise the description to correctly name the lake as Lake Limestone, rather than Lake Limonite.

G10. FutureGen Texas Team (Walden, Steven – Walden Consulting)

O53-27 In Table 2-3 regarding Weather Information for Odessa, TX – The table incorrectly labels the weather data. Please revise the table to clarify that the values represent "Average Monthly Precipitation" rather than Precipitation; and "Average Wind Speed" rather than Wind Speed for each season.

O53-28 Offsite Populations – The DEIS states that for the Odessa site "Fort Stockton is about 8 miles (13 kilometers) west of the injection site, although there may be a shorter distance between the nearest of the 10 injection wells and the town, depending on the exact location of the wells." Please revise the description to clarify that Fort Stockton is actually more than 8 miles from the outer boundary of the estimated maximum extent of the injection reservoir and that the exact well locations will be farther, not nearer, to the town.

O53-29 Key Factors Affecting Risk Assessment - The DEIS incorrectly states that populated areas are within 8 miles of the CO2 injection site for Odessa. Please revise the description to clarify that Fort Stockton is the closest populated area and is more than 8 miles from the outer boundary of the estimated maximum extent of the projected injection reservoir and that the exact well locations will be farther, not nearer to town.

G10. FutureGen Texas Team (Walden, Steven – Walden Consulting)

Response to Comment #1:	Section 2.5.2.2 was revised as follows: "LiDAR is an aerial technique that uses laser pulse travel times from an aircraft to the land surface to obtain high resolution topography data."
Response to Comment #2:	Section 3.1.7 was revised to read, "For all sites there would be a requirement to obtain a Multi-Sector General Permit for industrial stormwater control during post-construction operations."
Response to Comment #3:	Table C.1-2 has been revised to cite "30 TAC 116" was revised to "30 TAC 113" under NESHAP."
Response to Comment #4:	Table C.1-2 has been revised to cite "30 TAC 116" instead of "30 TAC 106" under the Air Construction Permit.
Response to Comment #5:	Table C.1.3 has been revised to cite "30 TAC 116" instead of "30 TAC 106".
Response to Comment #6:	The methodologies and assumptions are presented in the Risk Assessment Report. The Risk Assessment Report is included with the EIS.

G11. U.S. Environmental Protection Agency (Anne Norton Miller)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 26 2007

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

Mr. Mark L. McKoy
NEPA Document Manager
FutureGen Project
National Energy Technology Laboratory
U.S. Department of Energy
P.O. Box 880,
Morgantown, WV 26507–0880

Dear Mr. McKoy:

In accordance with our responsibilities under Section 309 of the Clean Air Act and the National Environmental Policy Act (NEPA), the Environmental Protection Agency (EPA) has reviewed the Department of Energy's (DOE) FutureGen Project Draft Environmental Impact Statement (EIS) (CEQ# 20070213). Our general comments are highlighted below.

The FutureGen Project was conceived to support the initiatives and recommendations of the National Energy Policy issued in May 2001. This included research, development, and demonstration programs with goals to develop and demonstrate coal power systems with near zero environmental emissions, while maintaining low production costs. In addition, this project supports the President's announcement emphasizing the need for the FutureGen Initiative, and other federal initiatives such as the National Climate Change Technology Initiative and the Hydrogen Fuel Initiative. These initiatives aim to reduce the Nation's output of greenhouse gas emissions from coal-fired energy production, to improve the global environment, and to provide advanced technologies to meet the world's energy needs.

Through this project, DOE proposes to provide federal funding to the FutureGen Alliance, Inc. for the design, construction, and operation of the first coal-fueled plant to produce electricity and hydrogen (H_2) with geologic sequestration of carbon dioxide. The current foreign government pledges of $80 million in addition to DOE's funding account for 74 percent of the net cost of the project. The goal is to prove the technical feasibility and potential economic viability of co-production of electricity and H_2 fuel from coal, while capturing and sequestering CO_2 and greatly reducing other air emissions. Another goal is to verify the effectiveness, safety, and permanence of CO_2 stored in geologic formations. The long-term benefit would be to test advanced power generation systems using Integrated Gasification Combined Cycle technology at a sufficiently large scale to allow industries and utilities to assess the project's potential for commercial application.

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While there are existing power plants that capture CO_2, in order to meet the FutureGen Project objectives, DOE requires advancements in the facility's design, experimentation in a near-laboratory setting, and operational technology development. These advancements would be more appropriate for a research platform, such as the FutureGen Project, rather than an existing commercial power plant. Major components needed to support the proposed project include:

- A power plant site and plant infrastructure;
- A sequestration site for CO_2 injection wells-related infrastructure, with a deep saline formation (i.e., the geologic formation where CO_2 would be stored);
- Utility connections and corridors (e.g., water supply, sanitary wastewater, electric transmission, natural gas pipelines, and CO_2 pipelines); and
- Transportation routes (rail and truck).

DOE has identified four reasonable alternative sites and will determine which sites, if any, are acceptable to host the project. The four sites include Mattoon, Illinois; Tuscola, Illinois; Jewett, Texas; and Odessa, Texas. If DOE approves more than one site, the host site will be selected by the Alliance. After the host site is selected, the Alliance will conduct additional site characterization studies, prepare a site-specific design (including any design modifications that would reduce risks), and obtain relevant environmental, utility, and operational permits for the project. EPA understands that based on the results of the additional site-characterization and site-specific preliminary design, DOE will re-examine the potential risks as part of a Supplemental Analysis or a Supplemental EIS before proceeding with funding for construction. A supplemental EIS may be required if there are substantial changes to the proposed action or significant new circumstances or information relevant to environmental concerns.

Comments/Recommendations

General

#1 The draft EIS indicates in several sections that FutureGen will use injection wells permitted as *Class V (experimental) wells* under EPA's Underground Injection Control program. While this is appropriate under the current regulatory structure, EPA is developing a strategy that may determine how large-scale, and commercial-scale, geologic sequestration projects will be permitted in the future. A new management framework for geologic sequestration injection wells may establish a totally new class of injection wells, with requirements tailored specifically for CO_2 geologic sequestration. It may become advantageous for injection wells related to FutureGen to be permitted under such a classification scheme. EPA will continue to develop this framework over the next several years, as data are collected from the pilot-scale and demonstration-scale geologic sequestration projects, and from research and development efforts led by DOE and their Regional Sequestration Partnerships.

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Cumulative Impacts

#2

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. In making this determination, some basis should be established for consideration for the appropriate delineation of both spatial and temporal boundaries, identifying "reasonably foreseeable future actions" surrounding the proposed action. The draft EIS identifies the spatial boundary of cumulative impacts (within a 50-mile radius). However, the temporal boundary of the impacts is not clear. DOE expects the plant would operate for at least 20 to 30 years, and potentially up to 50 years. The draft EIS indicates that this project would potentially use up 1.6 billion gallons of water/year and that much of this water may be lost to the local area and downstream consumers. For this reason, EPA recommends that the cumulative impacts of water use be evaluated for at least the potential 50-year operational life of the project.

Protecting Underground Sources of Drinking Water

#3

The draft EIS discusses public "water supply aquifers," "potable drinking water aquifers" and "near-surface freshwater aquifers" without defining what these terms mean. The Safe Drinking Water Act defines underground sources of drinking water and describes how they must be considered under the Underground Injection Control program. We suggest that the final EIS contain a definition for each of the three types of aquifers that are discussed.

Wetlands

#4

EPA recommends that the draft EIS provide more details on how many wetlands may be impacted at each alternative site. For example, a table of direct and indirect impact acreages would be useful. For each location alternative, we recommend describing specific mitigation where impacts cannot be avoided; that is, the location of potential mitigation sites, wetland type, and ratios.

Base on the above issues we have rated the draft EIS Environmental Concerns/Insufficient Information (EC-2), (see enclosed "Summary of EPA Rating System").

G11. U.S. Environmental Protection Agency (Anne Norton Miller)

We appreciate the opportunity to review this draft EIS. We look forward to reviewing the final EIS related to this project. The staff contact for the review is Marthea Rountree and she can be reached at (202) 564-7141.

Sincerely,

Anne Norton Miller
Director
Office of Federal Activities

Enclosure:
Summary of EPA Rating System

4

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Response to Comment #1:

DOE understands that the Class V well classification cited in the EIS is appropriate under the current regulatory structure, but these regulations are subject to change in the future as more information is gained from pilot and demonstration-scale geologic sequestration projects.

Response to Comment #2:

While it would be appropriate to quantify water use for a 50-year period, it is generally difficult to obtain information on future projects over that timeframe. However, additional literature search was conducted and text was added to address the long-term use of groundwater aquifers in the regions surrounding the power plant sites. In Illinois, information regarding projected use of the Mahomet aquifer through 2020 was added. For the Texas sites, information from the 2007 State Water Plan was incorporated where statistics on water use projected until 2060 were presented.

Response to Comment #3:

DOE has replaced the phrases "potable aquifers", "potable water aquifers", "drinking water aquifers," "near-surface fresh water aquifer," and other phrases having the same meaning with the phrase "underground sources of drinking water," unless the context or source information indicates that something other than the regulation protected aquifers are being discussed. In particular, changes were made in Section 3.1.6 of the EIS. As a conservative measure, all aquifers are assumed to be legally protected underground sources of drinking water (USDWs) unless otherwise indicated by source document information or regional information about ground water salinity. DOE has made changes globally in the EIS in accordance with the guidance given here.

Response to Comment #4:

As discussed during the July 23rd, 2007 meeting between EPA and DOE regarding EPA comments/clarifications on the FutureGen EIS document, a Supplement Analysis will be required once the site is selected. Currently, the EIS document relies on a combination of wetland delineation and National Wetland Inventory (NWI) mapping to characterize wetland types, locations, and to determine potential impacts.

As indicated within the EIS Section 3.1.8, wetlands have been assessed at all four proposed sites; "DOE assessed the potential impacts to wetland and floodplain resources based on field verification (wetland delineation) and National Wetland Inventory (NWI) mapping. The Mattoon and Tuscola sites included field verification for the power plant sites and other project components (e.g., utility corridors), allowing for quantitative analysis using potential acreage (hectares) of impacts. The Jewett and Odessa sites included field verification for only the proposed power plant sites and relied on NWI mapping for all other project components, allowing for a qualitative assessment limited to wetland type occurring within the project component areas." This level of wetland analysis is further emphasized within each site-specific chapter (Sections 4.8.2.1; 5.8.2.1; 6.8.2.1; and 7.8.2.1).

The EIS tabulates impacts of wetlands (upper bounds scenario) that may occur from the construction of the power plant. Table S-12 and Table 3-3, notes the following wetland acreages at the power plant sites which could potentially be impacted – Mattoon: 0.05 acres low quality farm pond; Tuscola: None; Jewett up to 2 acres low quality wetlands, up to 0.1 acre moderate quality wetlands, and up to 18 acres low quality ponds; and Odessa: None**.** As also indicated in Table S-69 and Table 3-3 "Site design and layout would avoid impacts to wetlands that are on the site…." Wetland delineations have been conducted along both Mattoon and Tuscola utility corridors allowing for the tabulation of

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wetland impacts (worse case scenario) which may occur from construction of utilities have been included in Table S-12 and Table 3-3, "Mattoon: up to 29.2 acres; Tuscola: up to 5 acres." As detailed information (wetland delineation) regarding the utility corridors is not available for the Texas sites, DOE used the best available information (NWI mapping). Since NWI mapping is less accurate than field-verified wetlands information, the primary data that can be extracted from NWI mapping is the potential for wetland presence and the type of wetlands that can be expected in the area. For this reason, the EIS used the NWI mapping to determine the presence (number of potential wetlands affected) and wetland type within an approximately 800-foot corridor for the proposed water supply pipelines and an approximately 700-foot corridor for the proposed CO_2 pipelines. Overall, the NWI mapping indicates that wetlands within both Texas Sites are less than 0.5 acre, with the exception of a few wetland complexes associated with streams, or larger man-created surface water impoundments. Impacts to these larger wetland systems would most likely be avoided through directional drilling or through shifting pipeline alignments. Impacts to the smaller wetland systems (less than 0.5 acre) within the 700 to 800 foot corridor study areas could be avoided through the design process. Field verification would be required of all corridors once the respective site was selected. Regardless, impacts to these wetlands would be mitigated through the Section 404 permitting process. (Jewett – USFWS. 1988. National Wetland Inventory Maps for Buffalo, Butler, Jewett, Donie, Keechi, Lanely, Long Lake, Tennessee Colony, Turlington, and Yard, Texas, quadrangles; Odessa – USFWS. 1994. National Wetland Inventory Maps for Amburgey Ranch, Andrew, China Ranch, Clabber Hill Ranch, Cowden Place, Douro, East Mesa, East Mesa SW, Florey, Goldsmith, Kermit, NW, Metz, Monohans, North Cowden. Panther Dluff, Penwell, Pyote East, Red lakes, Saddle Butte, Seminole SE, Versue and Wheeler).

All four alternative sites have low quality of wetlands and low abundance of wetlands occurring throughout the potential project areas (either impacted by farming or mining activities). A majority of wetlands could be avoided through design and best management practices, and the mitigation required through Section 404 permitting. Therefore, it is DOE's opinion that the level of wetland analysis and evaluation of potential impacts discussed in the EIS provides sufficient data to consider potential wetland impacts and mitigation for each alternative and a reasoned alternative choice even though some data is lacking. Furthermore, the EIS acknowledges areas in which wetland data is lacking or where further studies are required throughout the document. Table S-12 and Table 3-3 (Jewett and Odessa) "Wetland delineation required for verification;" Section 3.1.8 (Jewett and Odessa) "With the exception of wetlands at the power plant site, all other areas would require a wetland delineation to verify wetland mapping." This is further emphasized in Section 3.1.8 (see quote above) and within Sections 6.8 and 7.8 of the EIS.

EPA's request for specific "mitigation where impacts cannot be avoided; that is, the location of potential mitigation sites, wetland types and ratios…" would require a wetland impact determination and specific wetland mitigation measures that are negotiated during the Section 404 permitting process. The USACE emphasizes avoidance, minimization of wetland impacts followed by mitigation of those impacts. During the permitting process, the actual design and construction footprint for both the power plant and associated utilities would be known and could be adjusted (i.e., shift in corridor alignment) to avoid or minimize impacts.