

1 **FutureGen Industrial Alliance, Inc.**

2 ***DRAFT***

3 ***Request for Proposals for FutureGen Facility Host Site***

4 This draft Request for Proposals (RFP) is being issued to provide potential offerors and other
5 stakeholders the opportunity to provide the FutureGen Industrial Alliance, Inc. (Alliance) with
6 comments and clarifying questions prior to the release of the final RFP. Potential offerors and
7 other stakeholders are encouraged to carefully review the instructions, qualifying (mandatory)
8 criteria, scoring criteria, the proposal evaluation process, the standard terms and conditions
9 governing negotiations with the winning offeror, and the Alliance rights set out in this draft RFP.

10 The Alliance will accept comments and clarifying questions on the draft RFP through midnight
11 (Eastern Standard Time) on February 28, 2006. The Alliance reserves the right to disregard
12 comments received after the deadline. The Alliance welcomes all comments and clarifying
13 questions regarding possible ambiguities, inconsistencies, or unduly restrictive specifications that
14 reviewers may identify. Comments and clarifying questions should be sent to
15 SiteRFP@FutureGenAlliance.org.

16 The Alliance will summarize the comments received and post them on its website at
17 www.FutureGenAlliance.org. Based on its review and consideration of the comments and
18 clarifying questions received, the Alliance will revise the draft RFP and issue a final RFP no
19 earlier than March 7, 2006.

20
21 **1. Introduction and Background**

22 The Alliance invites proposals for sites upon which the Alliance will build and operate the
23 world's first coal-based, near-zero emission power plant. The FutureGen power plant will
24 produce electricity and hydrogen-rich (H₂) synthetic gas from coal while capturing and
25 permanently storing carbon dioxide (CO₂) in a deep geologic formation. Proposals submitted
26 must comply with the instructions and procedures described in this RFP. The Alliance reserves
27 the right to exclude from evaluation any proposals that do not comply with the instructions and
28 procedures described in this RFP.

29 **1.1. Project Overview**

30 FutureGen is a government-industry cost-shared project to design, build, and operate the world's
31 first coal-based, near-zero emission power plant. The plant will also produce H₂ and byproducts
32 for use by other industries.

1 On December 2, 2005, the U.S. Department of Energy (DOE) entered into a co-operative
2 agreement with the FutureGen Industrial Alliance, Inc. to begin the site selection process and
3 prepare a conceptual design for the facility.

4 Alliance member companies are among the largest coal producers and energy generators in the
5 world. The operations of member companies span six continents: North America, Africa, Asia,
6 Australia, Europe, and South America. Alliance members intend to contribute up to \$250 million
7 toward the project's costs and, in addition, will bring valuable technical and industrial project
8 management expertise to the project. Further, the Alliance will facilitate the introduction of
9 advanced technologies into the plant that are based upon millions of dollars of past industrial
10 investment. The active role of industry in this project ensures that the public and private sector
11 share the cost and risk of developing the advanced technologies necessary to commercialize the
12 FutureGen concept.

13 The Alliance is incorporated as a 501(c)(3) (not-for-profit) corporation under rules of the U.S.
14 Internal Revenue Service. As a result, none of the members of the Alliance will realize any direct
15 financial benefit from their contributions to the Alliance. As a not-for-profit entity, the Alliance
16 will own the power plant and sell the electricity, H₂, and other useful byproducts to the
17 marketplace. Any revenues derived from operations and sales will be used to offset the project's
18 operating costs.

19 FutureGen is unique in a number of respects. Researchers and industry have made great progress
20 advancing technologies to support coal gasification, electricity generation, emissions control,
21 CO₂ capture and permanent geologic storage, and H₂ production. While these technologies exist
22 today in various states of development, they have yet to be integrated and tested at a single plant,
23 which is essential for such plants to be technically and commercially viable. DOE expects that
24 the technologies developed and proven through FutureGen will ultimately lead to plants that
25 produce electricity with less than a 10 percent increase in cost compared to plants that do not use
26 CO₂ capture technology.

27 The FutureGen plant will be designed to produce electricity that is equivalent to the amount used
28 by 150,000 average U.S. homes. The plant will gasify the coal through a process that will
29 convert the coal's carbon to synthesis gas consisting of mostly H₂ and carbon monoxide (CO).
30 The synthesis gas will react with steam to produce additional H₂ and a concentrated stream of
31 CO₂. This effort will lay the groundwork for developing similar power plants throughout the
32 world.

33 The H₂ can be used as a clean fuel in applications such as electricity generation in turbines, fuel
34 cells, or hybrid combinations of these technologies. The captured CO₂ will be separated from the

1 H₂ and permanently stored in deep saline formations, unmineable coal seams, depleted oil and
2 gas formations, and/or other safe geologic formations.

3 Ninety percent of the total CO₂ produced by the plant is expected to be captured initially. With
4 advanced technologies, this type of plant may eventually be able to capture up to 100 percent of
5 CO₂ emissions.

6 This RFP seeks proposals for suitable sites upon which to build the FutureGen facility. It
7 describes the site requirements including site access, ownership, CO₂ storage potential, and other
8 related issues. Based on the responses to this RFP and using the selection process described
9 below, the Alliance will identify candidate sites for the FutureGen facility. After the conclusion
10 of the DOE's National Environmental Policy Act (NEPA) compliance process, the Alliance
11 expects to select a preferred host site. For the host site, the Alliance will determine the final
12 design for the power plant and the specifications for safe and permanent CO₂ storage based on
13 the specific characteristics of the selected site. Information requirements in this RFP are
14 commensurate with a facility of the magnitude and type represented by FutureGen. The Alliance
15 and the successful offeror will enter into contractual negotiations for the Alliance's right to use
16 the site. Appendix A contains a list of terms and conditions that the Alliance proposes for the
17 resulting contract.

18 **1.2. Timeline for Solicitation**

19 As noted above, this RFP is being issued in draft for a two-week public review. After
20 consideration of any comments received, the Alliance will issue a final RFP no earlier than
21 March 7, 2006. Potential offerors will have one week from the issue date of the final RFP to ask
22 clarifying questions regarding the final RFP. Any clarifying questions received and Alliance
23 responses will be posted on the Alliance's website (www.FutureGenAlliance.org) within 72
24 hours after the close of the period allowed for clarifying questions. The Alliance reserves the
25 right to summarize or combine clarifying questions prior to posting them and the associated
26 responses. The Alliance also reserves the right not to respond to clarifying questions received
27 after the close of the period for clarifying questions. General comments or requests for revisions
28 will be addressed at the Alliance's sole discretion.

29 **The deadline for proposals will be eight weeks after issuance of the final RFP, which will**
30 **specify the exact deadline. Proposals received after this deadline will not be evaluated.**

31 **1.3. Site Selection Process**

32 Once the proposals are received, a site evaluation and selection process will begin. It involves
33 four stages, as shown in Figure 1-1 and described below.

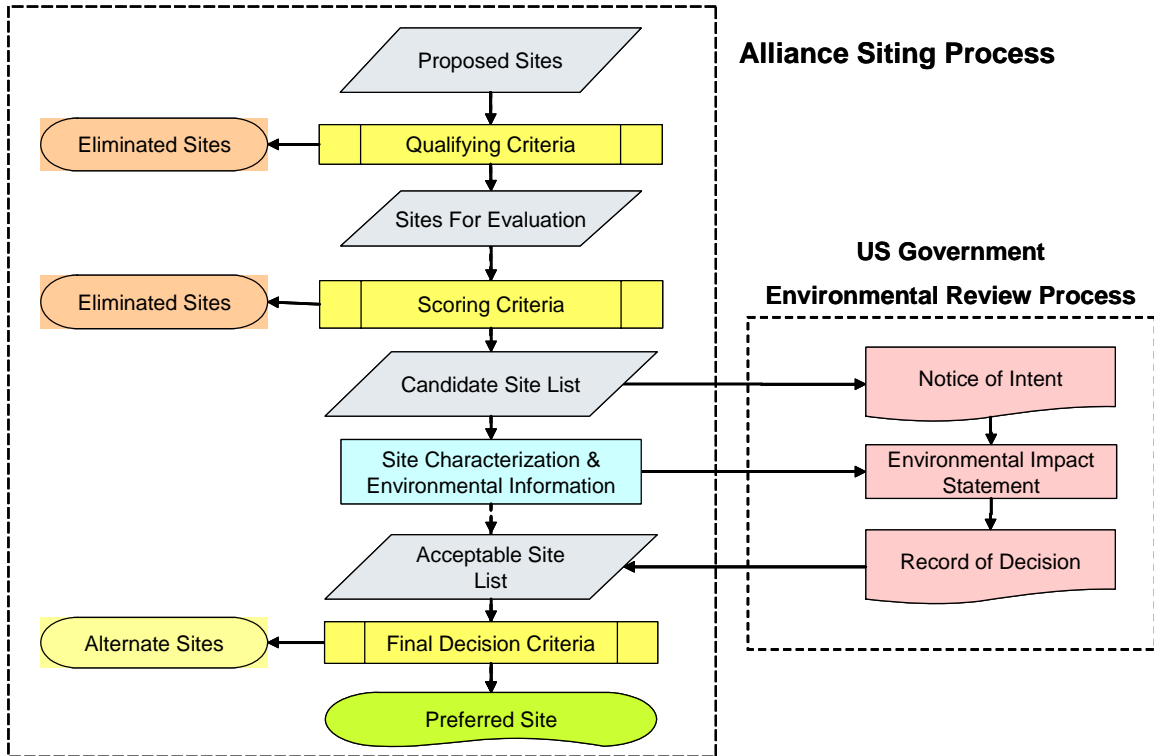


Figure 1-1. Overview of the Site Evaluation and Selection Process

- 1

2

3

4

5

6

7

8

• All proposals will be evaluated against the qualifying criteria described in this RFP (Section 3). These criteria are mandatory requirements, and any proposals that do not meet all of the qualifying criteria will be excluded from further consideration. Potential offerors are urged to ensure that their proposed sites meet each qualifying criterion before submitting a proposal.
- 9

10

11

12

• The proposed sites that meet the qualifying criteria will be evaluated using the scoring criteria described in this RFP (Section 3). Based on the Alliance’s evaluation of the proposals, a Candidate Site List, representing those sites that are best qualified to host the FutureGen facility, will be announced in late summer 2006.
- 13

14

15

16

17

18

19

20

• From the Candidate Site List, DOE will determine the reasonable site alternatives to be addressed in the environmental impact statement (EIS). To develop the EIS, the reasonable site alternatives will be evaluated by DOE for potential environmental impacts as required under NEPA. To support DOE’s NEPA process, the site offeror will be required to assist the Alliance and DOE with further characterization of their candidate site, including providing documentation for an environmental information volume (EIV) that will be provided by the Alliance to DOE. Each offeror whose site is included in the Candidate Site List will be expected to contribute data and

1 information and to cover all their costs associated with assisting the Alliance in the
2 preparation of the EIV. Based on findings during the NEPA process and the EIS
3 prepared in accordance with the NEPA process, DOE may provide the Alliance with
4 a list of acceptable sites in a Record of Decision. A Record of Decision is expected
5 approximately one year after the announcement of the Candidate Site List.

- 6 • Following the DOE Record of Decision, the Alliance expects to select a final site
7 among the sites found acceptable by DOE in the Record of Decision. The Alliance
8 intends to announce the final, preferred site for the FutureGen facility in September
9 2007.

10 **1.4. Points of Contact**

11 To ensure fairness in the site selection process, from the date the draft RFP is issued until the
12 Alliance announces the Candidate Site List, potential offerors and their representatives are
13 prohibited from discussing this procurement with any Alliance member companies or staff,
14 unless authorized in writing by the Alliance Chief Executive Officer. Any unauthorized contact
15 may disqualify the offeror from further consideration. Questions on the draft RFP must be
16 submitted in writing to SiteRFP@FutureGenAlliance.org. Should any issues arise with electronic
17 submittal due to a malfunction of the FutureGen Alliance website, the website technician may be
18 contacted at 202-429-8430. The website technician will not be able to answer questions on the
19 RFP itself.

20 **1.5. General Requirements and Conditions**

21 **1.5.1. Non-Responsive or Incomplete Proposals**

22 Offerors should familiarize themselves with the entire solicitation and furnish all the information
23 required. Proposals must be organized along the outline specified in this RFP and adhere to the
24 page limits specified herein. The Alliance reserves the right to refuse to evaluate, deem non-
25 responsive, and/or disqualify from further consideration those proposals that are missing any
26 requested information, are difficult to read or understand, or do not follow the format for
27 responding to the RFP. Elaborate brochures or other presentations beyond those sufficient to
28 present a complete and effective response to this RFP, within the page limit guidelines, are not
29 desired.

30 **1.5.2. Conflict of Interest**

31 In preparing and submitting their proposals, offerors or their representatives may not consult
32 with any individual or organization that is currently involved in the activities of the FutureGen
33 Alliance, including

- 1 • The member companies of the FutureGen Industrial Alliance (American Electric
2 Power, BHP-Billiton, China Huaneng Group, CONSOL Energy, Foundation Coal
3 Corporation, Kennecott Energy/Rio Tinto, Peabody Energy, Southern Company) or
4 their affiliated entities;

- 5 • Battelle Memorial Institute or any Battelle-affiliated company or National Laboratory
6 managed or co-managed by Battelle;

- 7 • Atlantic Partners LLC;

- 8 • The law firm of Van Ness Feldman;

- 9 • DOE and DOE’s National Energy Technology Laboratory (NETL);

- 10 • NETL’s site support contractors subject to organizational conflict of interest
11 restrictions;

- 12 • Any individual or organization that has reviewed or had other access to this RFP prior
13 to its release; and

- 14 • Members of the Alliance Technical Experts Group (TEG) or their organizations. TEG
15 members and their organizations are listed on the Alliance’s website at
16 www.FutureGenAlliance.org/Alliance/other.stm.

17 **1.5.3. Proposal Reviewers**

18 In order to evaluate the proposals, the Alliance may obtain assistance and technical expertise
19 from reviewers who are not Alliance employees or employees of the Alliance member
20 companies. By submitting proposals, the offerors agree to such reviews by non-Alliance
21 personnel under the terms of an Alliance non-disclosure agreement. Further, after the Alliance
22 concludes its review of the proposals, the Alliance will make all the proposals received available
23 to the DOE, along with a report covering the Alliance’s findings and the Alliance’s proposed
24 Candidate Site List. DOE may review all of these documents before initiating the NEPA process.
25 By submitting proposals, the offerors agree to such reviews by DOE personnel and DOE
26 contractor personnel.

27 **1.5.4. Amendment to the RFP**

28 This RFP can be modified only by express, formal amendment of the RFP and republication by
29 the Alliance. No other communication, whether oral or in writing, will modify the terms of this
30 RFP. Any amendments to the RFP will be posted on the Alliance website

1 (www.FutureGenAlliance.org). Offerors are responsible for checking the website for any such
2 amendments.

3 **1.5.5. Additional Information**

4 The Alliance seeks well-developed responses to the final RFP that will preclude the need for
5 additional or clarifying information. However, the Alliance reserves the right to ask offerors for
6 additional clarifying information, written responses to questions that would facilitate proposal
7 evaluation, or oral presentations. These requests may be unique to a particular proposal (i.e.,
8 each request for information may be unique), and the Alliance may not request additional
9 information or oral presentations from all offerors.

10 **1.5.6. Site Visits**

11 The Alliance reserves the right to visit one or more of the proposed sites.

12 **1.5.7. Supplemental Information**

13 As noted above, the site offeror will be required to assist the Alliance with further
14 characterization of their candidate site and document this characterization in an environmental
15 information volume (EIV) that will be provided to DOE in order to support DOE's NEPA
16 process. Each offeror whose site is included in the Candidate Site List will be expected to
17 contribute data and information and to cover all their costs associated with assisting the Alliance
18 in the preparation of the EIV. Requests for additional information will be made when the
19 Candidate Sites List is announced or shortly thereafter. It is anticipated that the supplemental
20 information would be due 30 to 120 days after the request is made. The amount of information
21 requested will be commensurate with that required for DOE to conduct the NEPA process and
22 the Alliance to begin site characterization. Offerors must cooperate with the Alliance, DOE, and
23 its NEPA contractor(s) in information collection and analysis (at their own expense) in order to
24 remain on the Candidate Site List.

25 **1.5.8. Multiple Proposals**

26 Offerors may, at their option, submit multiple proposals for different sites. In such cases, the
27 Alliance will evaluate each proposal independently. A separate, free-standing, complete proposal
28 must be submitted for each site.

29 **1.5.9. Cost of Preparing Proposals**

30 Responses to the information requested in this RFP are expected to be based on existing
31 information to the maximum extent possible. Geologic sampling of proposed sites and other
32 time-consuming or expensive activities are neither encouraged nor required. This RFP is based
33 on the premise that a well-organized and operating proposal team, with an appropriate mix of

1 expertise, and an appropriate site can respond in the timeframe provided for response. Any costs
2 incurred by offerors with respect to this RFP, and for subsequent requests for information, are
3 not reimbursable by the Alliance under any circumstances.

4 **1.5.10. Proposal Submission, Modifications, and Withdrawal**

5 Two hard copies of the proposals (and any subsequent modifications thereof) must be submitted.
6 Offerors must also submit one compact disc (CD) with a copy of the proposal, appendices,
7 attachments, support documents, and supporting information. The material must be provided in a
8 single file in a PDF format. The two hard copies and CD must be placed in sealed envelopes or
9 packages addressed to the following address:

10 FutureGen Industrial Alliance, Inc.
11 International Square
12 1875 I Street, N.W.
13 5th floor
14 Washington, D.C. 20006
15 Attn: Site Selection Team

16 The Alliance will confirm receipt of the proposal, within 48 hours, if an email address is
17 provided by the offeror in the cover letter transmitting their proposal.

18 Proposals submitted by electronic mail will not be considered. Proposals may be modified in
19 writing, if the modification is received by the deadline for receipt of proposals. Proposals may be
20 withdrawn by written notice received by the Alliance at any time before the final site selection.

21 **1.5.11. Disclosure of Offerors**

22 Offerors are advised that the Alliance may release to the public immediately after the RFP due
23 date a list of the offerors and the sites proposed in response to this RFP.

1 **2. Project Information**

2 This section provides additional information about the scope of the FutureGen program, the
3 overall goals for both the facility and the program, and implications for the facility.

4 **2.1. Project Scope**

5 As mentioned previously, the objective of the FutureGen is to design, build, and operate the
6 world’s first coal-fueled, near-zero emission power plant. The FutureGen power plant will
7 produce electricity and H₂ from coal while capturing and permanently storing CO₂ in a deep
8 geologic formation. The nominal 275-megawatt (MW) prototype plant will operate as a
9 production plant, generating commercially significant electric power. It will also provide a
10 large-scale engineering laboratory for testing new clean power, CO₂ capture, and coal-to-
11 hydrogen technologies, and the facility will include a test bed for testing and developing new
12 technologies. The FutureGen program intends to build and operate the cleanest coal-fueled
13 power plant in the world.

14 Many aspects of the FutureGen plant will employ cutting-edge technology. Rather than using
15 traditional coal combustion technology, the plant will be based on the coal gasification process in
16 which the coal’s carbon is converted to a “synthesis gas” made up primarily of H₂ and carbon
17 monoxide. Advanced technology will be used to react the synthesis gas with steam to produce
18 additional H₂ and a concentrated stream of CO₂. The H₂ will be used as a clean fuel for electric
19 power generation in turbines, or fuel cells, or hybrid combinations of these technologies, or for
20 other commercial uses.

21 The captured CO₂ will be separated from the synthesis gas and be permanently stored in one or
22 more subsurface geologic formations. This process is commonly referred to as geologic
23 sequestration or geologic storage. Candidate geologic formation(s) will include deep saline
24 formations (which are the most widely prevalent type of reservoir both in the United States and
25 worldwide) and could also include depleted oil and gas reservoirs, unmineable coal seams, and
26 other geologic formations. The target formation(s) will be intensively monitored to verify the
27 permanence of CO₂ storage and increase the world’s scientific understanding of CO₂ storage in
28 geologic formations.

29 **2.2. Program Goals**

30 The FutureGen facility will be designed to meet the following overall program goals:

- 31 • Design, build, and operate a commercial-scale power plant that produces electricity
32 and H₂ with near-zero emissions. The size of the plant (perhaps as large as 275 MW)
33 will be adequate to produce commercially relevant data, including meeting the
34 requirement for producing 1 million metric tons (MMT) per year of CO₂. The

1 scientific and engineering communities generally agree that this volume of CO₂ is
2 required to adequately validate the integrated operation of the gasification-based
3 power plant and the geologic formation(s) receiving CO₂.

- 4 • Consistent with the requirements and capabilities of the major components of the
5 power plant, capture and permanently store at least 90 percent of CO₂ emissions from
6 the plant, with the future potential to capture and permanently store nearly
7 100 percent.
- 8 • Prove the effectiveness, safety, and permanence of CO₂ storage.
- 9 • Establish standardized technologies and protocols for CO₂ measuring, monitoring,
10 and verification that document permanent geologic CO₂ storage.
- 11 • Validate the engineering, economic, and environmental viability of advanced, coal-
12 based near-zero emission technologies that by 2020 will produce electricity and H₂.

13 **2.3. Implications for FutureGen Facility**

14 Both the overall FutureGen program and the facility have aggressive goals. The successful
15 operation of the plant will build industrial and public acceptance for future near-zero emission
16 coal-fueled power plants of similar design characteristics. In order for this first plant to
17 effectively contribute toward that goal, it needs to provide the broad engineering and scientific
18 basis and understanding for building a new generation of coal-based power plants. Some desired
19 features of the design and siting of the FutureGen facility need to incorporate additional
20 requirements to improve wide applicability and technology transferability. Thus, the siting
21 criteria for the FutureGen plant are far more stringent than criteria that would be used to site
22 future, commercial, near-zero emission coal-fueled power plants. Two examples of more
23 stringent design and siting criteria that apply to the FutureGen facility but that would not apply to
24 future commercial power plants include (1) design flexibility for multiple coal types (i.e., the
25 ability to deliver and operate multiple ranks of coal), and (2) the intent to demonstrate effective
26 CO₂ storage in typical saline formations, which are the most spatially pervasive category of
27 geologic target formations both in the United States and around the world.

28 Some key determinants for siting the facility include:

- 29 • Availability of coal and water resources
- 30 • Sound geology for geologic storage of CO₂
- 31 • Appropriate infrastructure (e.g., rail, transmission lines, and site access)
- 32 • Ready market for electricity
- 33 • Favorable business environment, including cost-share opportunities
- 34 • Strong community support

1 **3. Qualifying and Scoring Criteria**

2 The proposals will be evaluated against the stated criteria (Parts 1 through 4) and the cost
3 contribution and risk considerations (Part 5) set forth in this section in accordance with the
4 procedures described below. DOE will review the potential environmental impacts of the sites on
5 the Candidate Site List to fulfill its requirements under NEPA regarding the proposed federal
6 action of cost-shared funding for the proposed project.

7 As explained in Section 1.3, the criteria for site selection are divided into three categories:
8 qualifying criteria (the mandatory requirements for any proposed site to be considered for the
9 facility), scoring criteria (consisting of desirable attributes for the proposed site, on which all
10 offerors who meet the qualifying criteria will be evaluated), and best-value criteria. Offerors
11 should ensure that they provide sufficient evidence against the stated criteria in Parts 1 through 4
12 of this section, and adequately address the best-value criteria described in Part 5.

13 The qualifying and scoring criteria for the FutureGen facility host site are divided into two broad
14 categories: those pertaining to the power plant (all aboveground facilities, including
15 transmission, transportation [road, rail, and barge], and pipeline corridors) and those pertaining
16 to the target CO₂ storage formation(s). Figure 3-1 shows the organization of the qualifying
17 criteria. Figures 3-2 and 3-3 show the organization of the scoring criteria.

18 The criteria and the data required for each criterion are explained in Parts 1 through 5 of this
19 section. Offerors to the RFP must adhere to the criteria numbering scheme used in this section.

20 **Unless specified otherwise, offerors must present the evidence required against each**
21 **qualifying and scoring criterion in one page or less, not including supporting**
22 **documentation.**

23 The following definitions are applicable:

- 24 • *Improved road* means a road rated to carry at least 20-ton trucks.
- 25 • *Proposed power plant site* means the minimum 400-acre area needed for the coal-
26 fueled power plant, associated processing facilities, fuel storage, on-site disposal (if
27 available), and a buffer zone.
- 28 • *Public access area (PAA)* means a state park or national park or preserve, national
29 monument, national seashore, national lakeshore, national wildlife refuge, designated
30 wilderness area, designated wild and scenic river, or study area for any of the
31 preceding designations.

- 1 • *Sensitive feature* means a dam, water reservoir, hazardous materials storage facility,
2 or Class 1 injection well.

- 3 • *Target formation* means a geologic formation capable of storing at least 12.5 MMT of
4 CO₂ at a rate of 0.25 MMT (250 kilotons) per year. Offerors must propose at least one
5 primary deep saline formation and may propose one or more additional target
6 formations of any type. Requested information must be provided for each proposed
7 target formation.

- 8 • *Suitable transmission line* means one that can carry at least 115 kilovolts (kV) and
9 has adequate capacity to accommodate FutureGen’s output without line upgrades.

- 10 • *Underground source of drinking water* means an aquifer, or its portion, which serves
11 as a source of drinking water for human consumption, or contains a sufficient
12 quantity of water to supply a public water system, and contains fewer than 10,000
13 milligrams per liter of total dissolved solids or does not contain constituents that
14 exceed maximum concentration limits specified by the EPA in National Primary
15 Drinking Water Regulations (40 CFR 141.62).

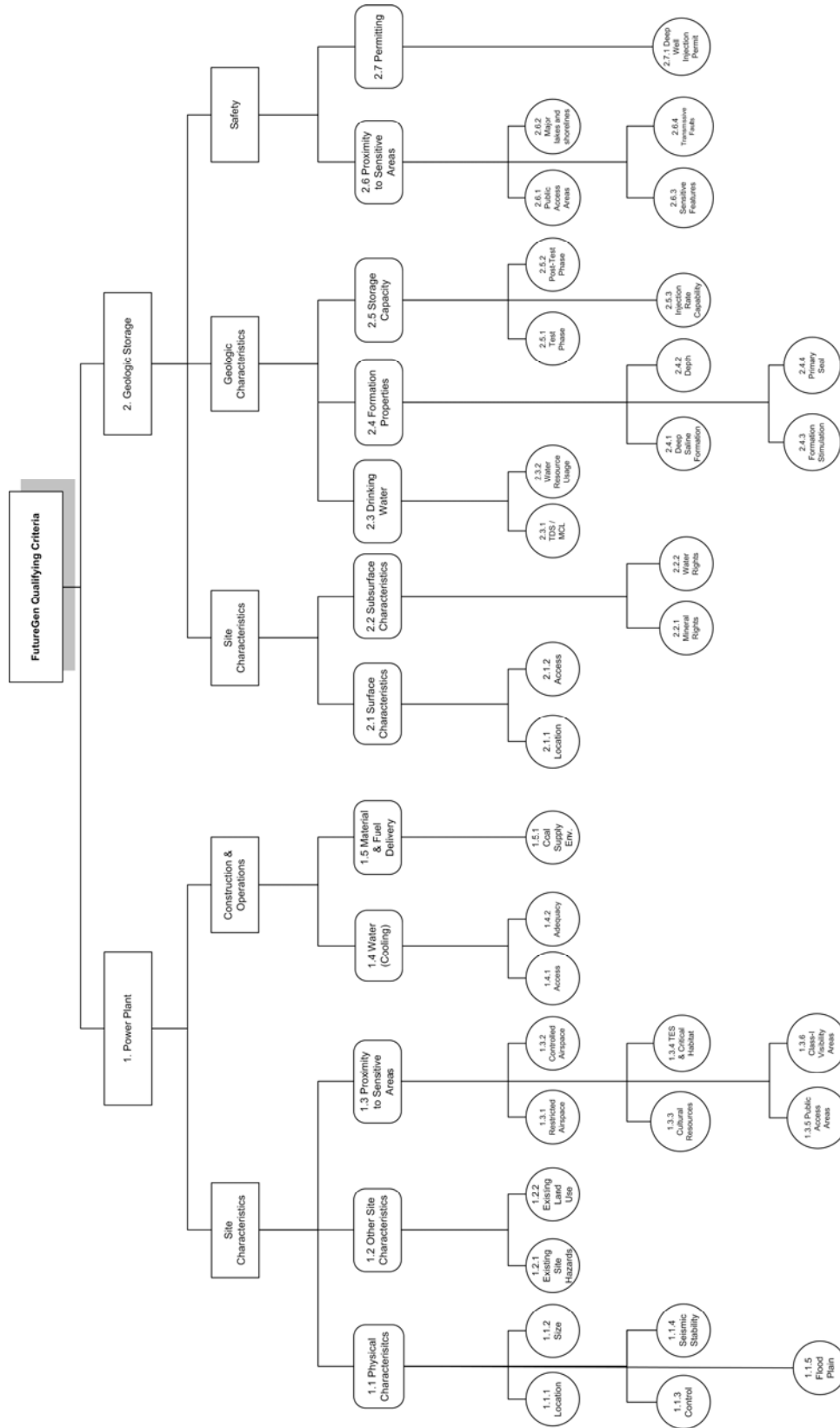


Figure 3-1. Qualifying Criteria for FutureGen Facility

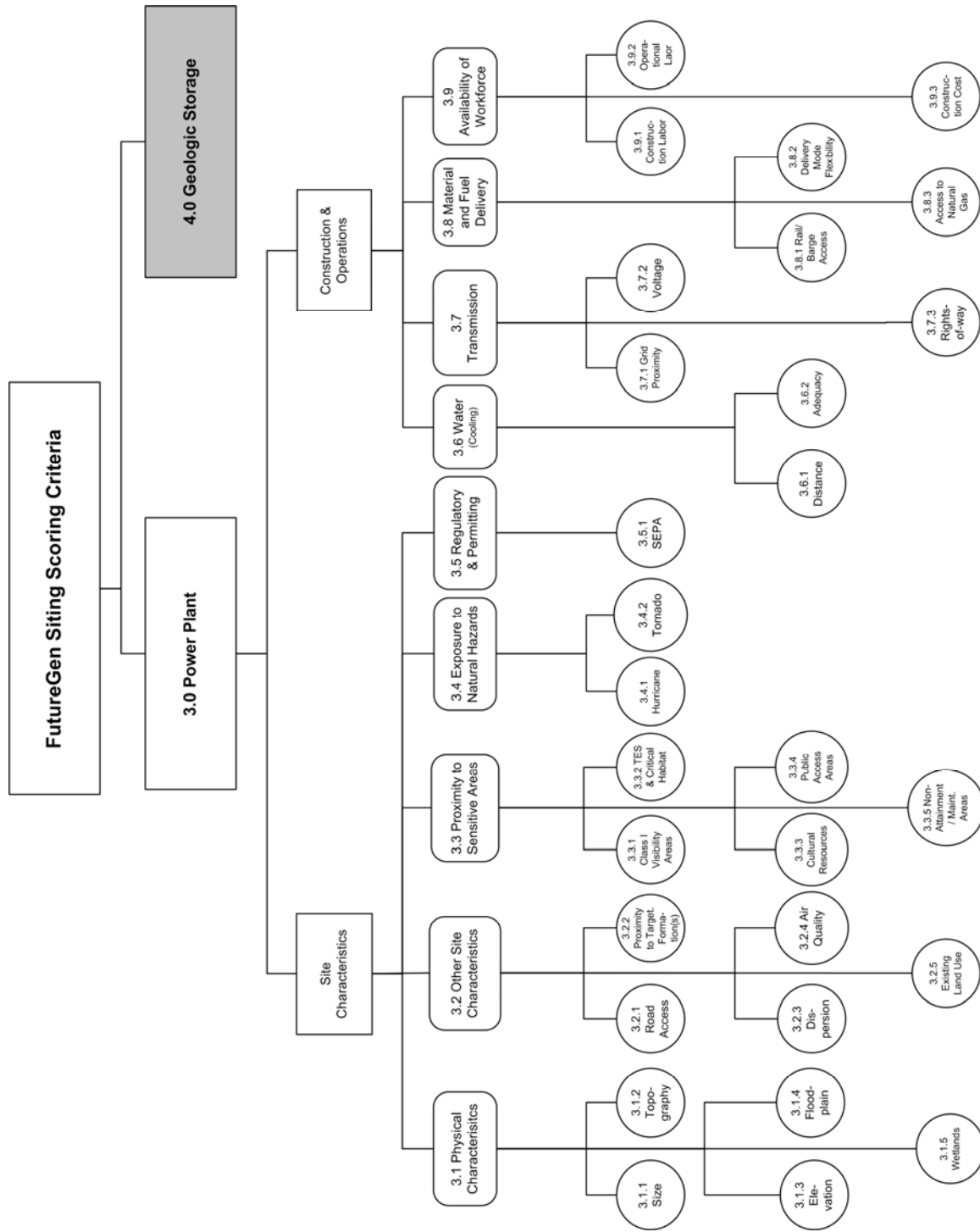


Figure 3-2. Scoring Criteria for FutureGen Facility Power Plant Site

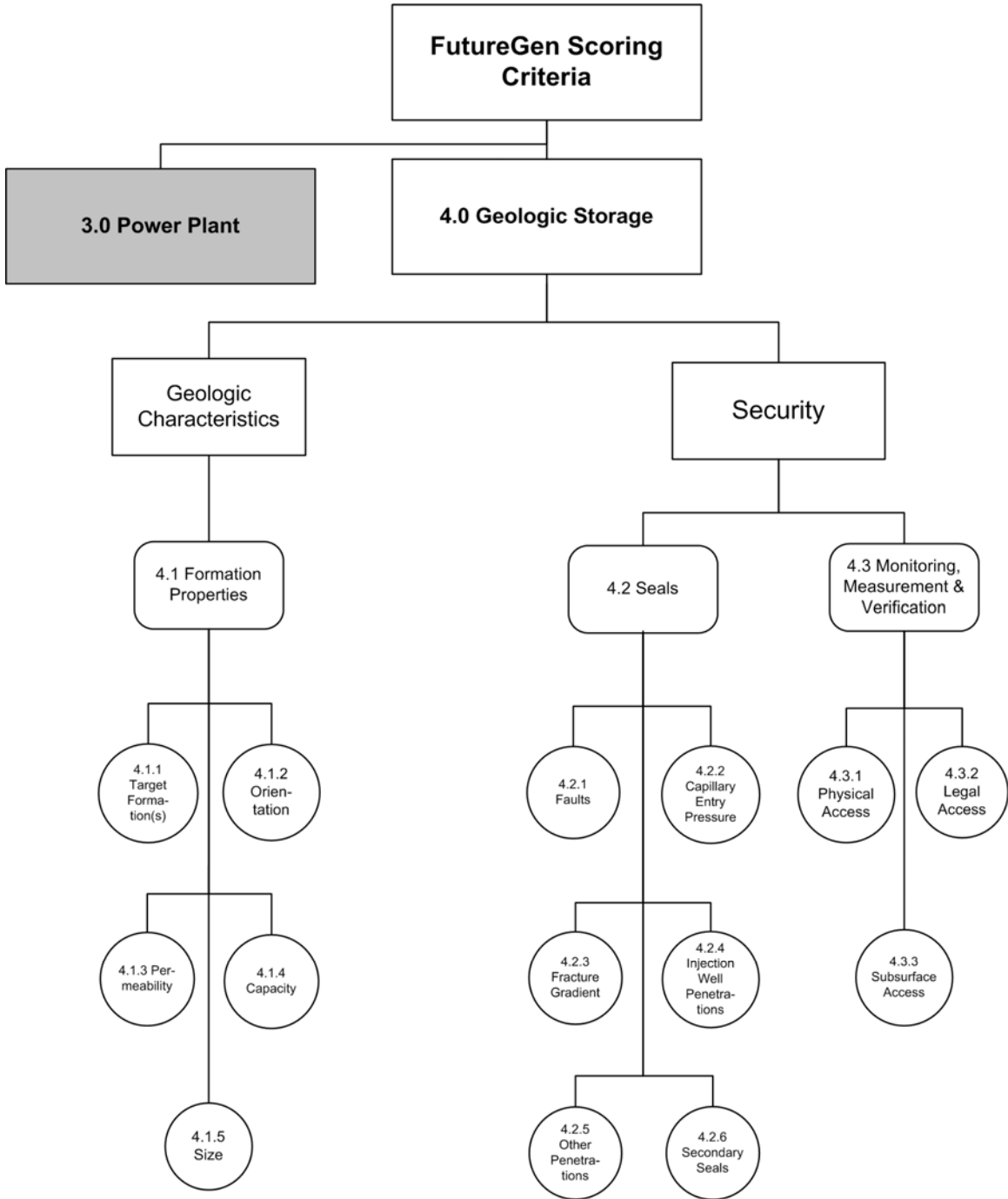


Figure 3-3. Scoring Criteria for FutureGen Facility Geologic Storage

1 **1. PART 1--Power Plant Qualifying Criteria**

2 **1.1. Physical Characteristics.** Under this category of criteria, offerors must provide
3 the following information:

4 1.1.1. **Geographic Location.** The proposed power plant site and the entire CO₂ target
5 formation(s) must be located within the United States with no risk of subsurface
6 migration of CO₂ outside the territory of the United States. The methodology for
7 calculating plume migration is provided in Appendix B. [See also Criterion 2.1.1]

- 8
 - 9 • Required evidence: Provide maps showing the location of the proposed power
10 plant site. Locations must be shown on the most recent edition of standard
11 United States Geological Survey (USGS) topographic quadrangles at a scale
 of 1:100,000 or 1:250,000, as appropriate.

12 1.1.2. **Size.** The area and linear dimensions of the proposed power plant site must
13 accommodate the FutureGen power plant and associated facilities. The proposed
14 site must not be less than 400 contiguous acres.

- 15
 - Required evidence: Same as for Criterion 1.1.1.

16 1.1.3. **Control.** The offeror must provide proof that the proposed power plant site is or
17 will be available for the proposed use. The offeror must state the nature (whether
18 to sell, lease, or donate) and terms (including proposed cost) for the transfer of
19 land title or leasehold rights to the Alliance for the proposed site. The offeror
20 must also demonstrate the availability of rights-of-way for all necessary
21 transmission line, transportation, and pipeline (water, CO₂, and natural gas)
22 corridors.

- 23
 - 24 • Required evidence: Provide preliminary title reports, a land survey plat or
25 plats, and a draft of the contracts that establish the rights to be conveyed. The
26 successful offeror must be able to close the real estate transfers to the Alliance
27 within 180 days of the announcement by the Alliance of the selection of a site
28 to host FutureGen and following the publication of a Record of Decision by
29 the DOE to proceed with the proposed project at a site selected by the
 Alliance.

30 1.1.4. **Seismic Stability.** The proposed power plant site must be free of risk from
31 significant seismic events.

- 1 • Required evidence: Provide supporting geological data and calculations
2 demonstrating peak ground acceleration less than 30 percent g, with a 2
3 percent chance of exceedance in 50 years, based on USGS seismic hazard
4 data.
- 5 1.1.5. Floodplain. The proposed power plant site must have low potential for flood
6 damage and plant shutdown. Designs typically locate critical equipment above the
7 100-year flood level, and preferably above the 500-year flood level. Non-critical
8 portions of plant systems (e.g., access roads) below the 100-year level can be
9 raised, diked, or otherwise protected as needed. Alternatively, offerors must
10 commit to grade the site to meet the floodplain requirement at no cost to the
11 Alliance. Generally, sites completely out of the floodplain or sites with room to
12 locate major plant equipment out of the floodplain are preferred over sites where
13 major equipment would be located in the floodplain.
- 14 • Required evidence: Provide documentation demonstrating what, if any,
15 portion of the proposed power plant site is within a 100-year floodplain, as
16 indicated on FEMA Flood Insurance Rate Maps, USGS flood-prone area
17 maps, or other government-sponsored maps. Areas below delineated 100-year
18 (and if known, 500-year) recurrence interval flood levels should be indicated
19 on the site map(s) prepared in response to Criterion 1.1.1.
- 20 **1.2. Other Site Characteristics.** Under this category of criteria, offerors must provide
21 the following information:
- 22 1.2.1. Existing Site Hazards. The site proposed for the facility must be free of hazardous
23 or radioactive chemicals and materials and free of wastes requiring special
24 handling, treatment, and/or disposal.
- 25 • Required evidence: Provide documentation demonstrating that the site is free
26 of hazardous or radioactive materials or wastes.
- 27 1.2.2. Existing Land Use. Current use, if any, on the proposed power plant site and
28 surrounding existing land use must be consistent with the construction and
29 operation of the FutureGen facility. If zoning regulations apply to the proposed
30 plant site, the site must be zoned heavy industrial/industrial; alternatively, the
31 offeror must demonstrate that the area could be zoned or rezoned for heavy
32 industrial/industrial use in a timeframe consistent with Alliance and project
33 schedule.

- 1 • Required evidence: Submit a copy of a local zoning map showing
2 compatibility with intended use. If no current zoning exists, the offeror must
3 include a letter from appropriate local authority undertaking to zone or rezone
4 the proposed plant site.
- 5 **1.3. Proximity to Sensitive Areas.** Under this category of criteria, offerors must
6 provide the following information:
- 7 1.3.1. Restricted Air Space. The proposed power plant site must be compatible with
8 existing military restricted use airspace.
- 9 • Required evidence: Submit the most current FAA Sectional Chart(s) for the
10 airspace above the site, with the proposed site location annotated on the
11 chart(s).
- 12 1.3.2. Controlled Air Space. Assuming a 250-foot maximum height for a startup and test
13 phase stack, the proposed power plant site must be compatible with existing and
14 projected protected airspace of affected airports.
- 15 • Required evidence: Use FAA Part 77 Airspace analysis standards to
16 demonstrate compatibility with nearby airports as necessary.
- 17 1.3.3. Cultural Resources. The portion of the proposed power plant site that would be
18 physically disturbed must be free of structures that are listed on, or eligible for
19 listing on, the National Register of Historic Places, and be free of known cultural
20 or archeological resources, including Traditional Cultural Properties.
- 21 • Required evidence: Submit a recent cultural resources report or concurrence
22 letters from State Historic Preservation Office (SHPO) and/or Tribal Historic
23 Preservation Office (THPO) demonstrating that a significant portion of the
24 proposed power plant site is free of structures that are listed on, or eligible for
25 listing on, the National Register of Historic Places, and are free of known
26 cultural or archeological resources, including Traditional Cultural Properties.
- 27 1.3.4. Threatened and Endangered Species (TES) and Critical Habitat. The portion of
28 the proposed power plant site to be disturbed must be free of known federally-
29 listed TES and critical habitat for TES (excluding migratory birds).
- 30 • Required evidence: Submit a recent biological survey or a letter from the U.S.
31 Fish and Wildlife Service demonstrating the absence of TES or critical habitat
32 for TES on a significant portion of the site. If TES or critical habitat occurs on

1 the site, the affected areas must be shown on the site survey map submitted
2 under Criterion 1.1.1.

3 1.3.5. Proximity to Public Access Areas. The proposed power plant site must be located
4 outside of and not adjacent to the boundaries of any PAA.

- 5 • Required evidence: Provide a site map showing that the proposed power plant
6 site is not on or adjacent to a PAA. The site survey map provided under
7 Criterion 1.1.1 should indicate the presence of such areas, if any.

8 1.3.6. Proximity to Class I Visibility Areas. The proposed power plant site must be
9 located at least 60 miles (100 kilometers) beyond the boundaries of any
10 Mandatory Class I Visibility Area.

- 11 • Required evidence: Provide the distance to the nearest Class I Visibility Area
12 from proposed power plant site.

13 **1.4. Cooling Water.** Under this category of criteria, offerors must provide the
14 following information:

15 1.4.1. Access to Cooling Water. To avoid disruption to plant operations, the proposed
16 power plant site must have access to reliable supplies of industrial water at
17 minimum sustainable flow rates. Industrial water for the power plant must be
18 available at a sustainable flow rate of not less than 1500 gallons per minute
19 (gpm). The offeror must provide evidence of sustainable flow rates as indicated
20 above, which will depend on the source of the water supply.

- 21 • Required evidence: Identify the proposed water source. For sites with access
22 to public water supplies, include a statement from the public service provider
23 that adequate supply is available and that supply lines of sufficient size exist
24 near the site boundary or a commitment that adequate lines will be installed at
25 no cost to the project. If surface water usage is anticipated from lakes or
26 streams with allocated surface water rights or permits, the proposal must so
27 state and provide proof of an unencumbered right to withdraw water at the
28 minimum sustainable flow rates identified above. If groundwater usage is
29 proposed in a state with allocated groundwater rights, the proposal must so
30 state and provide proof of an unencumbered right to draw water at the
31 minimum sustainable flow rates identified above.

32 1.4.2. Adequacy under Low Flow Conditions. For the water source identified in
33 Criterion 1.4.1, the offeror must provide evidence that the source is capable of
34 supplying plant make-up requirements of 1000 gpm under low flow conditions.

- 1 • Required evidence: For the water source identified under Criterion 1.4.1,
2 provide the 7Q10 statistic for the lowest streamflow for seven consecutive
3 days that occurs on average once every 10 years.

4 **1.5. Material and Fuel Delivery.** Under this category of criteria, offerors must
5 provide the following information:

6 1.5.1. Coal Supply Environment. In order for the FutureGen facility to fulfill its
7 programmatic goals, it needs to be capable of operating with more than one major
8 coal rank. Therefore, it is required that more than one major coal rank be able to
9 be delivered to the proposed plant site by more than one transportation mode, at
10 competitive prices. Generally, sites with access to competing fuel transporters and
11 alternate, low-cost fuels are preferable to sites without this access.

- 12 • Required evidence: Provide evidence that more than one major coal rank can
13 be delivered to the proposed power plant site by more than one transportation
14 mode. Discuss the cost of fuel per ton and the cost of transporting the fuel for
15 each system (e.g., rail, truck, and/or barge) capable of servicing the proposed
16 site, for each fuel projected to be used (e.g. anthracite, bituminous, sub-
17 bituminous, or lignite).

18 **2. PART 2—Geologic Storage Qualifying Criteria**

19 Offerors must propose at least one primary deep saline formation and may propose one or
20 more additional formations of any type. Requested information must be provided for each
21 proposed target formation.

22 **2.1. Surface Characteristics.** Under this category of criteria, offerors must provide
23 the following information:

24 2.1.1. Location. The proposed geologic formation(s) must be located within the United
25 States with no risk of subsurface migration of CO₂ outside the territory of the
26 United States.

- 27 • Required evidence: Provide a map showing the location of the proposed
28 power plant site and the proposed target formation(s) (see also Criterion
29 1.1.1). Locations must be shown on the most recent edition of a standard
30 USGS topographic map at an appropriate scale. Provide a conceptual well
31 configuration plan to meet the CO₂ storage capacity and injectivity
32 requirements described in Criteria 2.5.1 through 2.5.3. The location of any

1 injection well in this plan must be a minimum distance of 20 miles
2 (32 kilometers) from a U.S. border.

3 2.1.2. Access. While ownership of the land above the projected subsurface CO₂ plume is
4 not required, the Alliance must have sufficient access to the land surface above
5 the proposed target formation(s) to implement a rigorous monitoring program. At
6 least 60 percent of the land above the proposed target formation(s) must be
7 physically accessible for installation of surface and subsurface monitoring
8 equipment.

- 9 • Required evidence: Provide a USGS map at an appropriate scale showing
10 access restrictions to the land above the proposed target formation(s). Access
11 restrictions include, but are not limited to, lakes, rivers, or other bodies of
12 water, PAAs, and infrastructure including roads, buildings, or other developed
13 property. Identify the type (local, state, or federal government or private) and
14 number of landowners above the target formation(s) and any known
15 landowner-imposed access restrictions to the site.

16 **2.2. Subsurface Site Characteristics.** This category of criteria is designed to ensure
17 the free and unencumbered rights of the Alliance to use the proposed target
18 formation(s) for injection and storage of CO₂. Under this category of criteria,
19 offerors must provide the following information:

20 2.2.1. Mineral Rights. The offeror must own or have a demonstrated ability to obtain,
21 purchase, or obtain a waiver of subsurface mineral rights within and immediately
22 adjacent to proposed target formation(s) to accommodate an injection capacity of
23 50 MMT of CO₂.

- 24 • Required evidence: Provide proof of ownership or ability to obtain by
25 purchase, lease, or eminent domain the subsurface mineral rights in the area
26 encompassing the proposed target formation(s). Provide proof of title (mineral
27 rights), contract options to purchase, or letters of commitment from
28 governmental authorities with the power of eminent domain. Provide proof of
29 rights or waiver of rights to underlying mineral deposits (e.g., oil, gas or coal),
30 if these resources cannot be reasonably or securely accessed by the current
31 title holder after the CO₂ storage occurs.

32 2.2.2. Water Rights. The offeror must own or have a demonstrated ability to obtain,
33 purchase, or obtain a waiver of subsurface water rights within and immediately
34 adjacent to the proposed target formation(s) to accommodate the injection of
35 50 MMT CO₂.

- 1 • Required evidence: Provide proof of ownership or ability to obtain by
2 purchase, lease, or eminent domain any subsurface water rights in the area
3 encompassing the proposed target formation(s). Provide proof of title, contract
4 options to purchase, or letters of commitment from governmental authorities
5 with the power of eminent domain. Provide proof of rights, or waiver of
6 existing rights, to underlying water, if this resource cannot be reasonably or
7 securely accessed by the current title holder after the CO₂ storage occurs.

8 **2.3. Drinking Water.** This category of criteria is designed to protect current and
9 future sources of drinking water. The offeror must provide reasonable evidence
10 that the proposed target formation(s) is not a current or future source of drinking
11 water. The following criteria address this requirement.

12 2.3.1. Total Dissolved Solids or Maximum Concentration Levels. Proposed target
13 formation(s) must not be a current source of drinking water.

- 14 • Required evidence: Provide evidence that the proposed target formation(s) is
15 not a current source of drinking water, based on the definition of an
16 underground source of drinking water contained in Section 3, Qualifying and
17 Scoring Criteria.

18 2.3.2. Water Resource Usage. The broad definition of an underground source of
19 drinking water was mandated by Congress to ensure that future underground
20 sources of drinking water would be protected, even where those aquifers are not
21 currently being utilized as a drinking water source or could not be used without
22 some form of water treatment.

- 23 • Required evidence: Provide evidence that the proposed target formation(s) is
24 not a potential source of drinking water. In addition, provide evidence of
25 availability of sufficient alternative water resources to meet local water usage
26 needs for the next 10 years. This may include a comparison of local water
27 usage history with existing local water supply resources exclusive of the
28 proposed target formation(s).

29 **2.4. Formation Properties.** Under this category of criteria, offerors must provide the
30 following information:

31 2.4.1. Deep Saline Formation. At least one proposed target formation must be a
32 geologically distinct deep saline formation suitable for CO₂ injection.

- 1 • Required evidence: Provide evidence that at least one proposed target
2 formation is a deep saline formation capable of meeting at least 60 percent of
3 the injectivity and capacity requirements given in Criteria 2.4.2 through 2.5.3.
- 4 2.4.2. Depth. CO₂ is a supercritical fluid at temperatures above 31°C and a pressure of
5 approximately 73 atm. To help ensure consistent physical properties for the CO₂
6 in the proposed target formation, and to facilitate modeling of the CO₂ injection
7 and dispersal within the target formation, the primary deep saline formation must
8 have in situ hydrostatic pressure and temperature conditions above the CO₂
9 critical point.
- 10 • Required evidence: Provide pressure and temperature data for the primary
11 deep saline formation. The shallowest portion of the target formation below
12 the primary seal must be above the CO₂ critical point.
- 13 2.4.3. Formation Stimulation. The proposed primary deep saline formation must have
14 sufficient storage capacity to meet the project goals without dependence on large-
15 scale physical or chemical stimulation techniques.
- 16 • Required evidence: Provide calculations and supporting geologic data that
17 minimal injectivity targets of 1 MMT CO₂ per year can be met in the primary
18 deep saline formation, with hydraulic fracture stimulation, acoustic
19 stimulation, or chemical stimulation accounting for no more than 25 percent
20 of the injectivity goal.
- 21 2.4.4. Primary Seal. The proposed target formation(s) must have a primary seal
22 (caprock) capable of long-term containment of the injected CO₂. A primary seal
23 must have sufficient thickness (greater than 20 feet [6 meters]), be regionally
24 extensive, and be continuous over the entire projected CO₂ plume boundary after
25 injection of 50 MMT of CO₂. It also must have sufficiently low vertical
26 permeability and have sufficiently high capillary entry pressure to provide a
27 barrier to the migration of CO₂ out of the target formation.
- 28 • Required evidence: Provide calculations and supporting hydrogeologic data
29 demonstrating the hydraulic characteristics, quality, and continuity of the
30 primary seal.
- 31 **2.5. Storage Capacity.** The proposed target formation(s) must have sufficient
32 capacity for CO₂ storage to ensure that project goals are met. Therefore, under
33 this category of criteria, offerors must provide the following information:

1 2.5.1. Storage Capacity During Test Phase. FutureGen project goals call for injecting a
2 minimum of 1 MMT CO₂ per year over the project Test Phase, which consists of
3 the first four years after startup.

- 4 • Required evidence: Provide calculations and supporting hydrogeological data
5 demonstrating CO₂ storage capacity of at least 4 MMT in the proposed target
6 formation(s) over the first four years of the project (test phase).
7 Hydrogeological data used in the calculation must be based on well logs, core
8 data, or field testing data representative of the target formation(s) obtained
9 within 10 miles (16 kilometers) of the proposed injection well(s) for the
10 demonstration phase unless geological data show convincing evidence of
11 regional lateral continuity of target formation properties, in which case data
12 may be obtained from areas within this region of proven lateral continuity.

13 2.5.2. Storage Capacity Post-Test Phase. Power plants have a typical operating life of at
14 least 30 years. The FutureGen facility will be designed and constructed in a
15 manner that allows operation for this timeframe. Should CO₂ capture and storage
16 continue past the Test Phase, storage capacity is required to meet this objective.

- 17 • Required evidence: Provide calculations and supporting hydrogeological data
18 demonstrating CO₂ storage capacity of at least 50 MMT in the target
19 formation(s) over the minimum 30-year life of the plant. Hydrogeological data
20 used in the calculations must be based on well logs, core data, or field testing
21 data representative of the regional geological setting of the proposed target
22 formation(s).

23 2.5.3. Injection Rate Capacity. In addition to the required total storage capacity of the
24 site (see Criteria 2.5.1 and 2.5.2), the proposed target formation(s) also must
25 support a CO₂ injection rate goal of 1 MMT of CO₂ per year for up to 30 years.

- 26 • Required evidence: Provide calculations and supporting hydrogeological data
27 that demonstrate the ability to safely inject a minimum of 1 MMT of CO₂ per
28 year. The well configuration (number of wells, horizontal, deviated, or vertical
29 orientation) required to obtain this injection rate must also be provided.

30 **2.6. Safety and Security.** The Alliance is committed to ensuring the security of the
31 injected CO₂ in the target formation(s) and minimizing the risk to the surrounding
32 environment. Therefore, under this category of criteria, offerors must provide the
33 following information:

1 2.6.1. Public Access Areas. The land above the proposed target formation(s) must not be
2 on a PAA. The bottomhole location of any injection well must be no closer than
3 10 miles (16 kilometers) from any PAA.

- 4 • Required evidence: Provide a topographic map at an appropriate scale
5 showing the location and plan outline of all PAAs relative to the proposed
6 target formation(s) and planned injection wells.

7 2.6.2. Major Shorelines and Lakes. The proposed target formation(s) must not intersect
8 marine shorelines or other major surface bodies of water. The bottomhole location
9 of any injection well must be no closer than 10 miles (16 kilometers) to marine
10 shorelines and major surface water bodies. Major surface water bodies include
11 lakes greater than 150 feet (46 meters) deep or covering an area of more than
12 0.75 square miles (approximately 2 square kilometers).

- 13 • Required evidence: Provide a topographic map at an appropriate scale
14 showing outlines of marine shorelines and major bodies of water relative to
15 the proposed target formation(s) and planned injection wells.

16 2.6.3. Sensitive Features. The land above the proposed target formation(s) must not
17 intersect dams, water reservoirs, hazardous materials storage facilities, Class 1
18 injection wells, or other sensitive features. The bottomhole location of any
19 injection well must be no closer than 10 miles (16 kilometers) to any sensitive
20 feature.

- 21 • Required evidence: Provide a topographic map at an appropriate scale
22 showing the location of the proposed target formation(s) and planned injection
23 wells relative to regional sensitive features. For Class 1 wells, a letter from the
24 UIC permitting agency stating that there are no Class 1 wells intersecting the
25 target formation is sufficient.

26 2.6.4. Relation of Primary Seal to Active or Transmissive Faults. The primary seal must
27 not be intersected by any known historically active or hydraulically transmissive
28 faults.

- 29 • Required evidence: Submit a geologist's summary documenting that no
30 known active or transmissive faults intersect the primary seal.

31 **2.7. Permitting.** Deep well injection permits are a prerequisite to undertaking injection
32 of CO₂ into any target formation. Therefore, under this category of criteria,
33 offerors must provide the following information:

1 2.7.1. Deep Well Underground Injection Control (UIC) Permits. The offeror must have
2 a demonstrated ability to obtain applicable UIC permits.

- 3 • Required evidence: Provide evidence that applicable UIC permits are likely to
4 be obtainable for the number and locations of injection wells anticipated to
5 meet CO₂ capacity and injectivity requirements.

6
7 **3. PART 3—Power Plant Scoring Criteria**

8 **3.1. Physical Characteristics.** Under this category of criteria, offerors must provide
9 the following information:

10 3.1.1. Size. This criterion addresses the availability of additional acreage at the site to
11 support future expandability of the facility. Larger sites are preferred.

- 12 • Data requested: Provide the total area available at the proposed location.

13 3.1.2. Topography. This criterion address how much groundwork will be required at the
14 site before it is suitably graded for facility construction.

- 15 • Data requested: Provide the ground slope (in percent) across the proposed
16 power plant site as indicated by the topographic map.

17 3.1.3. Elevation. The performance efficiency of the power plant is lower at high
18 altitudes. It is therefore desirable to locate the facility at an elevation less than
19 5000 feet (1520 meters) above sea level.

- 20 • Data requested: Provide elevation ranges across the proposed power plant site,
21 as indicated by the topographic map.

22 3.1.4. Floodplains. It is preferable that as much of the proposed power plant site as
23 possible be located above the 100- and 500-year floodplains, in order to maximize
24 safety and flexibility in locating sub-facilities.

- 25 • Data requested: Provide the area above 100- and 500- year floodplain at the
26 proposed power plant site.

27 3.1.5. Wetlands. It is preferable that adverse impacts to wetlands be avoided as much as
28 possible.

- 29 • Data requested: Provide the number of acres of wetlands present on the
30 proposed power plant site and within any new proposed transmission line,
31 transportation, or pipeline corridors and describe the quality of each wetland
32 area.

1 **3.2. Other Site Characteristics.** Under this category of criteria, offerors must provide
2 the following information:

3 3.2.1. Road Access. It is preferable that improved roads providing access to the site be
4 as close to the site boundary as possible. Sites with improved roads closest to the
5 site will score more highly.

- 6 • Data requested: Provide the distance from site boundary to the nearest
7 improved road.

8 3.2.2 Proximity to Proposed Target Formation. While it is not necessary for the target
9 formation to immediately underlie the proposed site for the FutureGen facility, it
10 should be close to the proposed power plant site in order to facilitate construction
11 of pipelines. It is preferable for cost and construction considerations for the
12 proposed power plant site and the proposed target formation to be as close as
13 possible.

- 14 • Data requested: Provide the distance from the power plant site to the proposed
15 CO₂ injection site.

16 3.2.3 Dispersion. Any emissions from the facility will disperse more readily under
17 favorable terrain conditions. Dispersion conditions will be evaluated as a proxy of
18 the fraction of terrain elevation to the startup and test phase stack height (assume
19 250 feet [76 meters]).

- 20 • Data requested: Provide the highest terrain elevation at and within one mile of
21 the proposed site.

22 3.2.4 Air Quality. The existing air quality at the site is a key determinant of the ease
23 and ability to obtain the necessary air quality permits.

- 24 • Data requested: Provide the existing levels of each National Ambient Air
25 Quality Standards (NAAQS) criteria pollutant at the proposed site, against
26 which the projected emissions from the facility must be overlaid.

27 3.2.5 Existing Land Use. It is preferable to have the FutureGen facility located on a site
28 where it will be consistent with surrounding land uses.

- 29 • Data requested: Provide a description of the existing land uses within one mile
30 of the boundaries of the proposed power plant site and identify these on a map
31 of appropriate scale.

- 1 **3.3. Proximity to Sensitive Areas.** Under this category of criteria, offerors must
2 provide the following information:
- 3 3.3.1. Class I Visibility Areas. It is preferable to locate the FutureGen facility as far as
4 possible from the boundaries of any Mandatory Class I Visibility Area.
- 5 • Data requested: Provide the distance from the site boundary to the boundary
6 of the closest Mandatory Class I Visibility Area.
- 7 3.3.2. TES and Critical Habitat. It is preferable to have no documented TES or critical
8 habitat on any part of the proposed plant site or in any transmission,
9 transportation, or pipeline corridor.
- 10 • Data requested: Provide information on documented occurrences of TES or
11 critical habitat on or within one mile of the proposed power plant site
12 boundary or any new transmission line, transportation, or pipeline corridor.
13 Include a discussion of any potential mitigation actions if such occurrences
14 are on the site or within a corridor.
- 15 3.3.3. Cultural Resources. It is preferable that the documented occurrence of cultural,
16 historical, or archaeological resources or Traditional Cultural Properties be such
17 as to allow maximum flexibility in locating various parts of the facility at the
18 proposed site.
- 19 • Data requested: Provide information on documented occurrences of cultural,
20 historical, or archaeological resources or Traditional Cultural Properties on or
21 within one mile of the proposed power plant site boundary or any new
22 transmission line, transportation, or pipeline corridor. Include a discussion of
23 any potential mitigation actions if such occurrences are on the site or within a
24 corridor.
- 25 3.3.4. Public Access Areas. It is preferable to locate the FutureGen facility as far as
26 possible from the boundaries of designated PAAs (see definition in Section 3).
- 27 • Data requested: Provide the distance from the proposed site and any new
28 transmission line, transportation, or pipeline corridor to the nearest PAA.
- 29 3.3.5. Non-Attainment / Maintenance Areas. It is preferable to locate the FutureGen
30 facility as far as possible from any EPA-designated non-attainment or
31 maintenance areas.

- 1 • Data requested: Provide the distance from the plant to the nearest border of
2 the nearest area listed by the EPA as either a non-attainment area or as a
3 maintenance area for any criteria air pollutant.
- 4 **3.4. Exposure to Natural Hazards.** In order to minimize any risks to the project, it is
5 preferable to site the FutureGen facility in an area with minimal risks of natural
6 hazards. Under this category of criteria, offerors must provide the following
7 information:
- 8 3.4.1. Hurricanes. The proposed site should not pose an undue risk of damage to the
9 FutureGen facility due to hurricanes.
- 10 • Data requested: Provide the site designation, if any, by the U.S. Landfalling
11 Hurricane Probability Project.
- 12 3.4.2. Tornadoes. The proposed site should not pose an undue risk of damage to the
13 FutureGen facility due to tornadoes.
- 14 • Data requested: Provide the FEMA definition of the number of tornadoes per
15 1000 square miles (2600 square kilometers) of the area encompassing the
16 proposed site.
- 17 **3.5. Regulatory and Permitting.** Under this category of criteria, offerors must
18 provide the following information:
- 19 3.5.1. State Environmental Policy Act (SEPA). The imposition of any requirements of
20 SEPA (where applicable) on the construction and operation of the FutureGen
21 facility can impact project and/or schedule.
- 22 • Data requested: Discuss the requirements of the applicable SEPA (if any), its
23 comparability to NEPA documentation, and whether both sets of requirements
24 can be addressed simultaneously.
- 25 **3.6. Cooling Water.** Under this category of criteria, offerors must provide the
26 following information:
- 27 3.6.1. Distance to Water Source. It is preferable to have the identified source for the
28 cooling water be as close the site as possible.
- 29 • Data requested: Provide the distance to the water source identified under
30 Criterion 1.4.

1 3.6.2. Volume of Water Available. Flexibility in meeting cooling water requirements is
2 desirable. It is preferable that water be available in excess of the minimum 1500
3 gpm [Criterion 1.4.2].

- 4 • Data requested: Provide the location and quantity of available water in excess
5 of 1500 gpm and demonstrate its availability to the project.

6 **3.7. Transmission.** Under this category of criteria, offerors must provide the
7 following information:

8 3.7.1. Grid Proximity. It is preferable for the transmission grid to be as close as possible
9 to the power plant site in order to minimize line construction efforts and right-of-
10 way issues.

- 11 • Data requested: Propose one or more power transmission line corridors
12 extending from the proposed power plant site to the suggested point(s) of
13 interconnection with the existing grid and provide the lengths of each
14 proposed corridor. Delineate these corridors on USGS topographic maps
15 (either 7.5-minute quadrangles or 1:100,000 or 1:250,000 scale, as
16 appropriate).
- 17 • Data requested: To address the siting and construction of new power
18 transmission lines, identify (by citation) potentially applicable laws,
19 regulations, and ordinances related to the siting and construction of power
20 transmission lines; state the relevant purposes of each law, set of regulations,
21 or ordinances; identify the regulatory agency for each permit, regulatory
22 process, or ordinance; and provide a general description of relevant regulatory
23 processes (applicant, fees, typical requirements of the owner/operator, type of
24 public participation, duration of permits and renewal periods, typical
25 application processing time, associated approvals, etc.) or explain the steps to
26 securing permits.

27 3.7.2. Voltage. It is preferable to be able to connect to higher voltage transmission lines.

- 28 • Data requested: Provide the rating (765 kV / 345 kV / 230 kV / 138 kV / 115
29 kV line) for the identified transmission line within 15 miles (24 kilometers) of
30 the facility.

31 3.7.3. Rights-of-Way. In addition to identifying a suitable connection point and
32 transmission line, offerors must also address the siting and construction of new
33 power transmission lines.

- 1 • Data requested: Discuss the length of proposed transmission line connection
2 corridors, and the fraction of the identified corridors for which the offeror has
3 obtained or can obtain rights-of-way.
- 4 **3.8. Material and Fuel Delivery.** Construction and operations costs for the
5 FutureGen facility are inherently dependent on the costs of delivery materials and
6 fuel to the proposed site.
- 7 3.8.1. Distance to Rail and/or Barge Delivery. Rail or barge delivery is generally the
8 most economical mode of delivery for fuels and materials to the site.
- 9 • Data requested: Submit a USGS map at an appropriate scale showing the
10 nearest rail corridor and/or barge delivery point. If a rail corridor is proposed
11 to be built as part of the proposal, include a USGS map at an appropriate scale
12 showing the proposed rail corridor. In addition, describe the process for
13 building the proposed corridor, including applicable laws and regulations,
14 permit applications, and timeframe for applications, approvals, and
15 construction.
- 16 3.8.2. Delivery Mode Flexibility. Sites with access to competing fuel transporters are
17 preferable to sites without such access.
- 18 • Data requested: Discuss possible delivery modes to the site, including the
19 number of viable rail or barge options or truck options.
- 20 3.8.3. Access to Natural Gas Pipeline. The coal-gasification facilities to be utilized by
21 the FutureGen plant require natural gas as a start-up fuel. In order to minimize the
22 costs and rights-of-way issues with construction of a natural gas pipeline,
23 proximity to an existing pipeline is preferable.
- 24 • Data requested: Submit a USGS map at an appropriate scale showing the
25 nearest natural gas pipeline(s) to the site with sufficient capacity to serve the
26 FutureGen facility.
- 27 **3.9. Availability of Workforce.** Availability of a sufficient quantity of labor during
28 construction and operation, and the prevailing labor costs in the region, are
29 important considerations in the economics of the project. Generally, sites with
30 access to an adequate supply labor at a competitive cost are preferred. Offerors
31 must provide data against the following criteria:

- 1 3.9.1. Construction Labor Availability. Sites must have access to an adequate supply of
2 construction labor, which is generally more readily available in high-population
3 areas.
- 4 • Data requested: Provide the distance from the proposed power plant site to the
5 nearest population center of at least 20,000 people and the nearest population
6 center of at least 50,000 people.
- 7 3.9.2. Operations Labor Availability. Operations labor generally requires a more
8 specialized skill set and can be more readily found in higher-population areas.
- 9 • Data requested: Provide the distance from the proposed power plant site to the
10 nearest population center of at least 50,000 people and the nearest population
11 center of at least 100,000 people.
- 12 3.9.3. Construction Cost. Sites with lower construction costs are preferred.
- 13 • Data requested: Provide the relative cost of heavy construction projects in the
14 area, as compared to the RSMMeans U.S. 30-city average.

16 **4. PART 4—Geologic Storage Scoring Criteria**

17 The organization of the geologic storage scoring criteria is shown in Figure 3-3. Offerors
18 must propose at least one primary deep saline formation and may propose one or more
19 additional formations of any type (such as enhanced oil recovery, enhanced coal-bed
20 methane, or coal seams). Requested information must be provided for each proposed
21 target formation, as applicable.

22 In addition to the basic geological properties required to satisfy the qualifying criteria,
23 sites that have enhanced characteristics that improve the ability or lower the cost to meet
24 the objectives of the FutureGen project will receive higher scores by the Alliance. These
25 characteristics are described below.

26 **4.1. Formation Properties**

27 This category describes properties of the proposed target formation(s) at the site that
28 further the objectives of the Alliance and improve the probability of meeting injectivity
29 and capacity goals for the project.

- 30 4.1.1. Proposed Target Formations. The Alliance requires the existence of at least one
31 deep saline formation capable of storing a minimum of 60 percent of the total
32 injection target of 50 MMT of CO₂. The Alliance will assign higher scores to sites
33 with a diversity of geologic target formations with differing potential trapping

1 mechanisms than to sites with fewer geologically distinct storage target
2 formations.

- 3 • Data requested: If additional target formations are proposed, provide the
4 distance to the additional target formations and a geologist's summary
5 indicating that each additional proposed target formation can support at least
6 25 percent of the capacity and injectivity targets described in Criteria 2.5.1
7 through 2.5.3.

8 4.1.2. Orientation. The distribution and migration of CO₂ in the primary deep saline
9 formation are greatly influenced by the structural dip of the formation strata.
10 Except for anticlinal closures, the Alliance will assign higher scores to sites with
11 lower average structural dip.

- 12 • Data requested: Provide supporting geological data and calculations
13 documenting the average structural dip of the deep saline formation bed
14 (excluding anticline closures) across the proposed formation.

15 4.1.3. Permeability. The magnitude and spatial variability of target formation
16 permeability greatly influence injectivity of CO₂, associated bottomhole well
17 pressure required to meet the injection rate target of 1 MMT per year, and residual
18 CO₂ saturations. The Alliance will assign higher scores to sites with thick target
19 formation intervals characterized by good matrix permeabilities in the primary
20 deep saline formation than to sites characterized by low permeabilities (less than
21 20 millidarcies [mD]). Additional consideration will be given to sites that have
22 moderate matrix permeabilities but are representative of a large percentage of the
23 potential deep saline formations in the United States.

- 24 • Data requested: Provide supporting data and/or calculations of expected
25 average gas permeability (in millidarcies) in the primary deep saline formation
26 and for each additional target formation if such data is available.

27 4.1.4. Capacity. Over the lifetime of the FutureGen plant, it is possible that over
28 100 MMT of CO₂ may be captured and potentially stored. Consequently, the
29 Alliance will assign higher scores to sites that provide supporting hydrogeological
30 data and calculations documenting CO₂ storage capability greater than the
31 50 MMT minimum required under the Qualifying Criteria (Criterion 2.5.2).

- 32 • Data requested: Provide geological data and calculations documenting CO₂
33 storage capability in the target formation(s).

1 4.1.5. Plume Size. For a variety of reasons associated with cost, access, liability, and
2 schedule, the Alliance will assign higher scores for target formations with
3 hydrogeological characteristics that result in a smaller overall land surface
4 footprint above the proposed formation(s) than to those with characteristics that
5 require a larger footprint to meet the injectivity and capacity goals set by the
6 Alliance.

- 7 • Data requested: Provide calculations showing the areal extent of the CO₂
8 plume after 50 MMT of CO₂ injection, using the methods shown in
9 Appendix B. Offerors may use alternative methods of performing the plume
10 calculation provided the methods and supporting data are documented in the
11 offeror's proposal.

12 **4.2. Seals**

13 The risk of CO₂ leakage from the target formation(s) is highest from faults and fractures,
14 rupture of the seal through overpressure-induced failure, and borehole penetrations. This
15 category of criteria is designed to help rank the quality of primary and secondary seal
16 integrity and evaluate the suitability of the proposed site for monitoring, measuring, and
17 verifying the fate of the injected CO₂. Under this category of criteria, offerors must
18 provide the following information:

19 4.2.1. Faults. The Alliance will evaluate the offeror's summary of faults and fracture
20 zones affecting the injection field and will assign higher scores to sites with a low
21 risk of fault-induced failure of CO₂ containment.

- 22 • Data requested: Provide supporting data from a geologist on the number and
23 geologic character of seismically detectable faults or major fracture zones
24 intersecting primary seals. This includes both sealing and non-sealing faults.

25 4.2.2. Capillary Entry Pressure. To prevent permeation of CO₂ through a primary seal,
26 injection pressures required to meet the 1 MMT CO₂ per year injection rate target
27 must remain below the capillary entry pressure of the overlying primary caprock
28 seal. The Alliance will assign higher scores to injection fields having a seal with a
29 larger ratio of capillary entry pressure versus peak bottomhole pressure required
30 to meet the injectivity target.

- 31 • Data requested: Provide data on the capillary entry pressure of primary seal(s)
32 for the principal deep saline formation and seals for any other proposed target
33 formation. This includes both lithologic and fault seals. Acceptable data
34 include direct laboratory measurements, data calculated from engineering and
35 well log sources, or estimations from physical properties of closely related

1 analog rock types, provided that the analogs are reliably representative of the
2 lithology at the proposed site. Using supporting data and calculations, provide
3 estimates of expected peak bottomhole pressures in each target formation
4 required to meet the injectivity target for the target formation.

5 4.2.3. Fracture Gradient. Rupture of the primary overlying seal through injection-related
6 overpressure is one of the primary risks in CO₂ leakage. Proposed sites that
7 demonstrate low differential in situ caprock or target formation stress and high
8 mechanical seal strength relative to injection pressure will be ranked higher by the
9 Alliance.

- 10 • Data requested: Provide supporting data and calculations on the strength of
11 primary caprock seals relative to regional and local stress fields. Based on a
12 conceptual well plan layout, include expected peak bottomhole pressure,
13 primary seal stresses (fracture gradient in pounds per square inch per foot is
14 acceptable), mechanical properties of the seals, and results of fracture tests, if
15 available.

16 4.2.4. Injection Well Penetrations. The Alliance will assign higher scores to proposed
17 sites that require fewer penetrations of the primary seals by injection wells to
18 meet injectivity targets.

- 19 • Data requested: Provide number and type (vertical, horizontal with projected
20 lateral reach) of injection wells required to meet the injection rate target of
21 1 MMT per year and to meet the capacity target of 50 MMT CO₂.

22 4.2.5. Other Penetrations. Proposed sites that have fewer penetrations of the primary
23 seals by active or abandoned non-project wells are considered to have lower risk
24 of CO₂ leakage and will require less well characterization and remediation
25 activity. The Alliance will assign higher scores to such sites.

- 26 • Data requested: Provide a map showing the location, depth, type (vertical,
27 deviated, or horizontal with lateral reach), and condition of active or
28 abandoned wells that penetrate the primary seal over the projected plume area
29 after injection of 50 MMT CO₂.

30 4.2.6. Secondary Seals. Secondary seals provide additional backup containment of the
31 CO₂ should an unlikely failure of the primary seal occur during or after CO₂
32 injection occurs. Consequently, the Alliance will assign higher scores to sites that
33 provide evidence of secondary seals. To be considered, secondary seals must:
34 overlie the primary caprock seal(s), be largely continuous, be greater than 10 feet

1 (3 meters) thick throughout, and cover at least 75 percent of the projected plume
2 after injection of 50 MMT CO₂.

- 3 • Data requested: Provide supporting data on secondary seals, if present.
4 Include the number of seals, thickness and lithology, and estimated extent.

5 **4.3. Monitoring, Mitigation, and Verification**

6 The ability to monitor each target formation and measure and verify the location and
7 movement of stored CO₂ is important in storage management. Therefore, in this section,
8 offerors are requested to provide data and documentation of surface accessibility above
9 the target formation(s), and accessibility to the subsurface for monitoring.

10 4.3.1. Physical Access. While ownership of the land above the CO₂ plume is not
11 required, the Alliance prefers sites that have unrestricted access to the land
12 surface above the proposed target formation(s) to implement a rigorous
13 monitoring program. The comprehensive monitoring program will likely include
14 installation of monitoring wells in strategic locations around the site in addition to
15 atmospheric and shallow subsurface monitoring stations. The Alliance will assign
16 higher scores to sites where more than 60 percent of the land above the proposed
17 target formation(s) is physically accessible for the installation of surface and
18 subsurface monitoring equipment.

- 19 • Data requested: Provide evidence for the percentage of the land above the
20 proposed target formation(s) that is physically accessible for installation of
21 surface and subsurface monitoring equipment. Access restrictions include, but
22 are not limited to, lakes, rivers, or other bodies of water, PAAs, and
23 infrastructure including roads, buildings, or other developed property.

24 4.3.2. Legal Access. The Alliance will assign higher scores to sites whose landowners
25 will periodically allow access to small portions of their property for monitoring,
26 mitigation, and verification activities.

- 27 • Data requested: Provide documentation of landowner permission in principle
28 to access small portions of their property periodically for monitoring,
29 mitigation, and verification activities.

30 4.3.3. Subsurface Access. Installation of monitoring well facilities requires not only
31 landowner permission but appropriate geological conditions for drilling, well
32 completion, and instrument installation. Sites that are well suited for monitoring
33 well installation will receive higher scores than sites where monitoring well
34 installation is less physically or economically achievable.

- Data requested: Provide a geologic descriptive summary of subsurface horizons above the topmost primary seal, with special attention to areas that would not be suitable/accessible for installation of monitoring wells.

5. PART 5—Best Value Assessment Criteria

In addition to the qualifying criteria and the scoring criteria detailed in Parts 1 through 4, the Alliance will conduct a Best Value Assessment to develop the Candidate Site List.

After applying the qualifying and scoring criteria, the Alliance will evaluate sites against the following criteria to identify the candidate sites for the FutureGen facility. The

Alliance will also use these criteria in selecting the final site, after completion of DOE’s NEPA process. **Information provided in response to this part should not exceed 15 pages, not including supporting documentation.**

Cost

Sites offered at no or nominal cost to the Alliance will be preferred over sites that require the Alliance to pay prevailing market prices. Offerors must specify the cost to the Alliance for ownership or lease of the proposed power plant site.

In addition, proposals that reduce the financial burden of the project proponents will be preferred. Offerors should identify any financial assistance, cost-share, or in-kind support offered in support of the proposal. The amount of financial support may have a significant impact on selection of the final, preferred site.

Availability and Quality of Existing Plant and Target Formation Characterization Data

Sites that are better characterized are preferred due to the inherently lower risk in siting the FutureGen facility at a well-characterized site. Offerors must identify and submit any environmental assessments; environmental impact statements; Phase I or II assessments; biological, cultural, floodplain, or wetland assessments; or other relevant site-specific analyses generated with respect to the proposed power plant site; associated new transmission line, transportation, or pipeline corridors; or surface area above the proposed target formation(s) within the last five years.

Land Ownership

Accessibility to or ownership of land for the proposed power plant site, supporting infrastructure, and target formation, and the timing and cost for such access, are critical to project success. Offerors who are able to demonstrate the highest degree of timely land use availability will be preferred. Offerors must provide evidence of current ownership or the willingness of current landowners to sell, lease, grant access to, or allow right-of-way

1 onto their property and at what cost (e.g. at, above, or below market value; or at no cost)
2 to the Alliance.

3 **Residences or Sensitive Receptors above Target Formation**

4 It is preferable to minimize the potential for off-normal events to impact residences or
5 other sensitive receptors (e.g., hospitals, schools, or nursing homes) above the proposed
6 target formation(s). Proposed target formations that involve the fewest residences and/or
7 sensitive receptors are desired. Offerors must identify the number of residences and/or
8 sensitive receptors above the proposed target formation(s). Offerors must also identify the
9 number and type (federal, state, local government, or private) of landowners above the
10 proposed target formation, including the projected migration plume for 50 MMT of CO₂.

11 **Waste Recycling and Disposal**

12 FutureGen will demonstrate technologies to address issues related to the recycling of
13 byproducts associated with coal gasification processes through scientific research,
14 development, and field testing. The amount and types of solid wastes will depend on the
15 design details of the power plant and the fuel used, which have not yet been finalized.
16 Although waste products will be recycled to the extent practicable, there will be residual
17 quantities of wastes that will require disposal. Offerors must discuss the extent to which
18 wastes can be disposed of on-site and/or the availability of off-site disposal or recycling.
19 This discussion must include the applicable permitting requirements for disposal and
20 recycling at the proposed power plant site. For those wastes that cannot be recycled, sites
21 that can demonstrate the availability of onsite disposal of solid wastes will be preferred.

22 **Clean Air Act Compliance**

23 As envisioned, FutureGen will be a near zero-emission plant during normal operations.
24 However, some criteria air emissions will be released during construction, startup and
25 routine operations, and upset conditions. Offerors must discuss air quality considerations
26 relative to Clean Air Act requirements in the region of the proposed site. In particular,
27 discuss the Prevention of Significant Deterioration increment that would be available for
28 each criteria air pollutant. The Alliance will prefer sites where necessary Clean Air Act
29 and other regional permits can be readily obtained.

30 **Expedited Permitting**

31 Permitting requirements are key risks to the project schedule and cost. The ability to
32 expedite the various permitting processes is highly desirable to the Alliance. Offerors
33 must identify all necessary federal, state, and local permits and approvals that may be
34 required for the proposed project, the time required for each individual permit or

1 approval, and the collective timeframe required for acquisition of all permits and
2 approvals. Any applicable state environmental review processes must also be addressed.
3 Evidence of successfully expedited permitting for similar projects will be viewed
4 favorably.

5 **Transmission Interconnection**

6 The transmission line that is proposed for grid connectivity must have sufficient capacity
7 and system reliability to accommodate the FutureGen plant's electricity output. To
8 facilitate the Alliance's evaluation of these issues, offerors must describe the status of the
9 interconnection arrangements of the transmission grid with the generating facility
10 currently providing power and energy across the transmission line proposed for grid
11 connectivity. Offerors must specify if the interconnection agreement has been completed,
12 or the status of the interconnection agreement if not completed. Offerors must identify all
13 transmission providers that the Alliance will need to work with for interconnections that
14 do not have an executed interconnection agreement. Offerors must describe the process,
15 plan, and schedule the Alliance would use to obtain interconnection with the applicable
16 transmission provider(s). If an interconnection agreement is already in place, offerors
17 must provide a copy of such interconnection agreement. The Alliance will prefer sites for
18 which there is documentation is provided that confirm grid stability with the addition of
19 275-MW to the grid.

20 **Background CO₂ Data**

21 Background levels of CO₂ and the fluctuations in the background on a daily, weekly,
22 monthly, and yearly basis will affect the atmospheric and soil monitoring program for
23 CO₂ over the proposed target formation. Offerors should provide supporting evidence of
24 baseline CO₂ levels in or in close proximity to the area above proposed target formation.
25 These data should be supplemented with additional background CO₂ data from local or
26 regional data sources outside of the immediate area of the target formation, if the offeror
27 believes these data relevant for comparison with the background CO₂ levels. The
28 Alliance will prefer sites where there is documentation regarding background levels of
29 CO₂.

30 **Power Sales**

31 One key revenue stream for the facility is the sale of the power generated. A commitment
32 by a state or other governmental entity, or a creditworthy organization, to commit to
33 purchase the power output of the FutureGen facility at actual production cost without
34 regard to market prices and without damages for failure to deliver the power is highly
35 desirable to the Alliance. This criterion will be given strong consideration in the
36 evaluation of the proposals.

1 **Market for H₂**

2 The FutureGen facility will produce H₂ in addition to electricity. Sites that demonstrate
3 existing nearby uses or an existing market for H₂ in the region will be preferred. Offerors
4 must identify any regional markets for H₂ and their distance from the proposed power
5 plant site.

1 **4. Format for Response and Evaluation Methodology**

2 **4.1. Format for Responses**

3 Offerors are strongly urged to read the RFP carefully and adhere to the page limits
4 specified by the Alliance. **The one-page response to each criterion should be free-**
5 **standing and capable of independent evaluation, without referring to the supporting**
6 **documentation for the requested information.** Offerors are also strongly urged to
7 provide specific evidence where requested by the Alliance. While the Alliance will
8 consider all submitted evidence carefully, it reserves the right to ask for clarifications or
9 reject any alternative evidence provided with the response to this RFP. Furthermore, the
10 Alliance reserves the right to investigate and reject any evidence or information
11 submitted in support of a site. A proposal containing information known to be false by
12 the offeror will be rejected.

13 Proposals must be clearly and concisely written, indexed, and logically assembled, per
14 the outline shown below. All pages must be appropriately identified with page numbers,
15 identity of the offeror, and date. Data and information submitted must be identified and
16 appropriately referenced in the text of the proposal. The proposal must follow the
17 sections and section number designations presented in this solicitation.

18 The proposal must follow the following format:

- 19
- 20 • Cover letter (explicitly identifying the offeror and providing necessary contact
21 information)
 - 22 • Summary (10 pages or less)
 - 23 • The next five parts must use the criterion numbering scheme used in this RFP:
24 Part 1 – Response to Power Plant Qualifying Criteria
25 Part 2 – Response to Geologic Storage Qualifying Criteria
26 Part 3 – Response to Power Plant Scoring Criteria
27 Part 4 – Response to Geologic Storage Scoring Criteria
28 Part 5 – Response to Best Value Assessment Criteria
 - 29 • Supporting documentation for the proposal, clearly indexed against the
appropriate criterion.

30 **4.2. Evaluation Methodology**

31 The overall site selection process is described in Section 1.3 of this RFP and is depicted
32 in Figure 1-1.

1 The first step in the evaluation of proposals will be to check for compliance with the
2 qualifying criteria. Proposals that do not contain sufficient evidence against the
3 qualifying criteria will not be evaluated further.

4 Those proposals that meet the qualifying criteria will be evaluated against the scoring
5 criteria. Each response will receive a quantitative score against each scoring criterion.
6 Three factors will determine the evaluation: the response provided by the offeror against
7 each criterion, the quality of the evidence or data upon which the response was based,
8 and the importance of each individual criterion to the overall project.

9 At the conclusion of the evaluation process, all qualifying proposals will be ranked. The
10 Candidate Site List will consist of those sites that, based on the qualifying, scoring, and
11 best value criteria, are clearly superior as compared to the rest of the sites proposed in
12 response to this RFP. This Candidate Site List will then be sent to DOE along with
13 documentation describing the process and rationale for selecting the Candidate Sites. The
14 sites in the Candidate Site List will then be evaluated through the NEPA process. As part
15 of the NEPA process, the Alliance will require the assistance of the offerors in preparing
16 the EIV for each site. The information needed for each site's EIV will be extensive and
17 must be provided at the offeror's expense.

1 **Appendix A—Proposed List of Terms and Conditions**

2 The FutureGen Industrial Alliance, Inc. intends to enter into a contract with the
3 successful offeror to acquire property for the proposed FutureGen facility. “Acquire”
4 means transfer of ownership and control of the property pursuant to a purchase and sale
5 agreement, deed, long-term (99-year) lease, purchase option exercisable by the Alliance,
6 or similar instrument (each a “Site Agreement”), in all cases free and clear of all
7 encumbrances. By submitting a response to the FutureGen Industrial Alliance Request for
8 Proposal (RFP), the offeror agrees to the acceptance of the following terms and
9 conditions, unless requests for additions or exceptions are made. Requests for additions
10 or exceptions to the terms and conditions must be submitted to the FutureGen Industrial
11 Alliance with the offeror’s proposal and must be accompanied by an explanation of why
12 the exception is being sought and what specific effect it would have on the offeror’s
13 ability to transfer the property or its use to the FutureGen Industrial Alliance. The
14 FutureGen Industrial Alliance reserves the right to address non-material requests for
15 exceptions with the successful offeror during contract negotiation. The FutureGen
16 Industrial Alliance will make any final determination of changes to the terms and
17 conditions and/or contract. Any additional terms and conditions not identified in the
18 offeror’s proposal will not be considered in the future. To the extent the offeror uses State
19 laws to support their proposal, references to State laws must include the specific clauses
20 being references versus broad brush statements about the laws. The contract will include
21 customary and reasonable terms and conditions consistent with offeror’s proposal, and
22 will also specifically include provisions that address the following:

23 **COMPLIANCE WITH LAWS:** The offeror must agree to comply fully with all
24 applicable federal, state, or local laws, rules, and regulations with respect to the transfer
25 of the interest in the property.

26 **EXCLUSIVE USE:** The FutureGen Industrial Alliance shall have exclusive use of the
27 offered property in perpetuity (for a transfer of ownership or sale) or for the term of the
28 contract (for a long-term lease), including all necessary surface and subsurface mineral
29 rights and water rights. The offeror will not interfere with the FutureGen Industrial
30 Alliance’s use of the property in accordance with the Site Agreement. The FutureGen
31 Industrial Alliance will use the offered property only for the construction, operation, and
32 management of the FutureGen project and related purposes. FutureGen will have no
33 obligation to invite the participation by the offeror in the development, construction,
34 operation, or management of the FutureGen and related facilities.

1 **FORCE MAJEURE:** Except for obligations to make any payment due the other party,
2 neither party shall be responsible for failure to fulfill its obligations due to causes that are
3 not reasonably foreseeable and beyond its reasonable control, including without
4 limitation, acts or omissions of government or military authority, acts of God, materials
5 shortages, transportation delays, fires, floods, labor disturbances, riots, wars, terrorist
6 acts, or any other causes, directly or indirectly beyond the reasonable control of the non-
7 performing party, so long as such party is using its best efforts to remedy such failure or
8 delays. However, in the event of unreasonable delays in performance by the offeror due
9 to a force majeure event, the Alliance may terminate the bid or negotiation process
10 without liability to any party.

11 **GOVERNING LAW AND ARBITRATION:** The laws of the state of New York will
12 govern the Site Agreement, without reference to conflict-of-laws principles. Any disputes
13 under the Site Agreement will be subject to arbitration that will occur in accordance with
14 the Commercial Arbitration Rules of the American Arbitration Association.

15 **HAZARDOUS CONDITIONS:** The offeror's proposal must disclose all hazardous
16 substances known by the offeror to be present on the property. The offeror will represent
17 and warrant the accuracy of such disclosures in the Site Agreement. The Alliance
18 reserves the right to conduct an environmental assessment of the property prior to
19 awarding the project to the offeror or entering into any Site Agreement with the offeror.

20 **INDEMNITY:** The offeror will indemnify the FutureGen Industrial Alliance and its
21 members against all losses, claims, etc., for personal injury or property damage arising
22 from or out of the offeror's negligent acts or omissions or any breach by the offeror of its
23 obligations under the Site Agreement, except to the extent caused by the negligence of
24 the FutureGen Industrial Alliance or by a breach of the Site Agreement by the FutureGen
25 Industrial Alliance. Neither party to the Site Agreement will be liable to the other for
26 indirect, special, or consequential damages. The offeror agrees to take title to the injected
27 CO₂ and indemnify the FutureGen Industrial Alliance and its members from any potential
28 liability associated with the CO₂.

29 **RELATIONSHIP OF PARTIES:** The offeror is an independent party. Nothing shall
30 imply a relationship of employment, agency, association of persons, partnership, or joint
31 venture. The offeror shall have no authority to commit the FutureGen Industrial Alliance
32 to any third party.

33 **SEPARABILITY CLAUSE:** A declaration by any court, or any other binding legal
34 source, that any provision of the Site Agreement is illegal and void shall not affect the

1 legality and enforceability of any other provision of the Site Agreement, unless the
2 provisions are mutually dependent.

3 **TAXES:** The offeror is liable for and must pay all taxes of any kind or nature levied on
4 or in connection with the acquisition of the property by the FutureGen Industrial
5 Alliance. The offeror shall be liable for and pay all fees and taxes. The offeror shall
6 indemnify the FutureGen Industrial Alliance against a failure to pay fees or taxes.

7 **TERMINATION OF CONTRACT:** Unless otherwise stated, the FutureGen Industrial
8 Alliance may, by written notice to the offeror, terminate the Site Agreement in whole or
9 in part at any time the offeror fails to perform the contract, and/or pursue any available
10 remedies at law or equity.

11 **U.S. FUNDS:** All prices and payments must be in U.S. dollars.

12 **VALID TITLE:** The offeror shall have valid title to the property and full authority to
13 enter into a Site Agreement with the Alliance. The offeror will provide corresponding
14 representations and warranties in the Site Agreement.

15 **WARRANTIES:** The offeror warrants that property offered will conform to the
16 specifications requested, and be fit and sufficient for the purpose intended.

1 **Appendix B—Example Calculation for Injected CO₂ Plume**
2 **Extent**

3

4 **B.1 Introduction**

5 Spreadsheet calculations are presented (see accompanying Excel spreadsheets) to
6 estimate the spatial extent of an injected CO₂ plume in a subsurface formation or
7 formations. The amount of injected CO₂ is fixed at 50 million metric tons (MMT). This
8 calculation represents a highly simplified geological model of a target formation, but
9 does provide a useful bounding estimate of plume extent given anticipated constraints on
10 site specific geological data available to each offeror. While detailed target formation
11 simulations are neither desired nor encouraged by the Alliance, offerors are free to
12 conduct their own calculations of plume extent, provided the input data used and
13 calculation details are provided to the Alliance in the offeror’s proposal. **These**
14 **calculations must be submitted with the offeror’s proposal.**

15 **B.2 Input Parameters**

16 There are six input parameters that must be provided by the offeror for each formation.
17 These input parameters are shown in the first worksheet tab named “User Input”. The
18 spreadsheet is set up for two formations, each accepting a portion of the injected CO₂,
19 and can be modified for injection into more formations.

20 ***B.2.1 Formation Depth***

21 This input parameter is the average depth of the geologic formation.

22 ***B.2.2 Formation Thickness***

23 This input parameter is the average thickness of the geologic formation in meters.

24 ***B.2.3 Effective Porosity***

25 This input parameter is an average value of the volume of connected pores in a unit
26 volume of the target formation.

1 **B.3.3 CO₂ Fugacity Coefficient**

2 The fugacity coefficient of CO₂ is calculated as a function of temperature and pressure.
3 The CO₂ fugacity coefficient table is based on an equation of state for supercritical CO₂
4 (SPAN and WAGNER, 1996). The worksheet named “Interpolate” performs bilinear
5 interpolation of the fugacity coefficient table contained in worksheets named
6 “Temperature” and “Fugacity Coefficient.”

7 **B.3.4 CO₂ Henry’s Constant**

8 The Henry’s Constant for CO₂ is calculated as a function of temperature and salinity
9 (BATTISTELLI et al., 1997) in the worksheet named “Henry’s Constant.” First, the
10 Henry’s Constant in pure water is calculated as an empirical function of temperature, and
11 then an empirical correction factor is applied based on the amount of dissolved NaCl.

12 **B.3.5 CO₂ Aqueous Mass Fraction**

13 The CO₂ aqueous mass fraction is calculated using Henry’s Law (REID et al., 1987)

$$\omega_{water}^{CO_2} = \frac{f^{CO_2} P}{H_{CO_2}} \frac{M_{CO_2}}{M_{water}}$$

14
15 where f^{CO_2} is the CO₂ fugacity coefficient, P is the pressure, H_{CO_2} is the Henry’s
16 Constant for CO₂, M_{CO_2} is the molecular weight of CO₂, and M_{water} is the molecular
17 weight of water.

18 **B.3.6 Aqueous Density**

19 The aqueous density of pure water is computed as a function of temperature and pressure
20 using the steam table formulations (MEYER et al., 1993) in the worksheet named
21 “Aqueous Density.” The aqueous density is corrected for salt content in the worksheet
22 named “Brine Density” (HAAS JR., 1976).

23 **B.3.7 Water Content**

24 This parameter is an average value of the volume of water per unit volume of the
25 formation. Here it has been assumed that 30% of the interstitial pore water will be
26 displaced by injected CO₂.

1 **B.5.4 CO₂ Plume Volume**

2 This is an estimate of the volumetric extent of the plume, assuming uniform geologic
3 properties, hydraulic conditions, and distribution of CO₂.

4
$$V = AL$$

5 Where *A* is the horizontal area of the plume (see Section B.5.3A.0), and *L* is the
6 thickness of the formation (see Section B.2.2A.0).

7 **B.6 References**

- 8 Bacon, D. H., M. D. White, and B. P. McGrail. 2004. *Subsurface Transport Over*
9 *Reactive Multiphases (STORM): A Parallel, Coupled, Nonisothermal Multiphase Flow,*
10 *Reactive Transport, and Porous Medium Alteration Simulator, Version 3.0.* PNNL-
11 14783, Pacific Northwest National Laboratory, Richland, Washington.
- 12 Battistelli, A., C. Calore, and K. Pruess. 1997. "The Simulator TOUGH2/EWASG for
13 Modelling Geothermal Reservoirs With Brines and Non-Condensable Gases."
14 *Geothermics* **26**(4):437-464.
- 15 Haas Jr., J. L. 1976. *Physical Properties of the Coexisting Phases and Thermochemical*
16 *Properties of the H₂O Component in Boiling NaCl Solutions. Preliminary Steam Tables*
17 *for NaCl Solutions.* Bulletin 1421-A, U.S. Geological Survey, Reston, Virginia.
- 18 Meyer, C. A., R. B. McClintock, G. J. Silvestri, and R. C. Spencer. 1993. *ASME Steam*
19 *Tables.* The American Society of Mechanical Engineers.
- 20 Reid, R. C., J. M. Prausnitz, and B. E. Poling. 1987. *The Properties of Gases and*
21 *Liquids.* McGraw-Hill.
- 22 Span, R. and W. Wagner. 1996. "A New Equation of State for Carbon Dioxide Covering
23 the Fluid Region From the Triple-Point Temperature to 1100 K at Pressures Up to 800
24 MPa." *J. Phys. Chem. Ref. Data* **25**(6):1509-1596.

25