U.S. Department of Energy

Lake Charles Carbon Capture and Sequestration Project

Final Environmental Impact Statement

Appendices

November 2013
DOE/EIS-0464





Office of Fossil Energy
National Energy Technology Laboratory

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Environmental Synopsis for the Lake Charles CCS Project

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ENVIRONMENTAL SYNOPSIS
Industrial Carbon Capture & Sequestration (ICCS)
Technology Area I
DE-FOA-0000015

January 2011

National Energy Technology Laboratory
U.S. Department of Energy
Morgantown, West Virginia

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INTRODUCTION

The U.S. Department of Energy (DOE or the Department) prepared this Environmental Synopsis pursuant to the Department's responsibilities under section 216 of DOE's National Environmental Policy Act (NEPA) Implementing Procedures set forth in 10 CFR Part 1021. This synopsis summarizes the consideration given to environmental factors and records that the relevant environmental consequences of reasonable alternatives were evaluated in the process of selecting awardees seeking financial assistance under Technology Area 1 of the Industrial Carbon Capture and Sequestration (ICCS) program In addition to financial and technical elements, DOE considered relevant environmental factors and consequences of the projects proposed to DOE in response to the funding opportunity announcement (FOA). DOE initially selected 12 applicants seeking financial assistance under Technology Area 1 and provided cost-shared funding for project definition activities; DOE then selected three of the initial twelve awardees for continued funding beyond project definition, pending completion of project-specific NEPA reviews. As required by section 216, this synopsis does not contain business, confidential, trade secret or other information that statutes or regulations would prohibit DOE from disclosing. It also does not contain data or other information that may in any way reveal the identity of the offerors.[1]

BACKGROUND

The ICCS program is a cost-shared collaboration between the government and industry to increase investment in clean industrial technologies and carbon capture and sequestration (CCS) projects. In contrast to other federally funded activities, these projects are not federal projects; instead, they are private projects seeking federal financial assistance. Under the ICCS funding opportunity, industry proposes projects that meet their needs and those of their customers while furthering the national goals and objectives of DOE. The successful development of advanced technologies and innovative concepts that reduce emissions of carbon dioxide into the atmosphere is a key objective of the nation's effort to help mitigate the effects of climate change.

Awardees under this FOA would receive assistance using funds appropriated by the American Recovery and Reinvestment Act of 2009, Public Law 111-5, (Recovery Act). The Recovery Act's purposes are to stimulate the economy and to create and retain jobs. Accordingly, special consideration was given to projects that promote and enhance job creation, preservation and economic recovery, in an expeditious manner. In accordance with the Recovery Act, and Section 703 of Public Law 110-140, DOE's two specific objectives were identified in the FOA as (1) Technology Area 1 – *Large-Scale Industrial CCS Projects from Industrial Sources*; and (2) Technology Area 2 – *Innovative Concepts for Beneficial CO_2 Use*. This synopsis specifically deals with the review process conducted for applications under Technology Area 1.

The applications reviewed under this FOA were initially selected for a first phase funding in October 2009 as the first of a two phase process for final awards of financial assistance. Under Phase I of the review process for Technology Area 1, DOE selected 12 projects related to the capture of CO_2 from industrial sources for geological storage or enhanced oil recovery (EOR). During Phase I, DOE provided cost shared funding for applicants to conduct project definition activities (e.g. preliminary design and permitting) and to prepare information that would assist the Department in performing its obligations pursuant to NEPA. Near the end of Phase I, awardees were given an opportunity to submit renewal applications for Phase II awards that would provide financial assistance for detailed design, construction and demonstration of the proposed technologies. DOE received eight renewal applications from the 12 projects selected under Phase I.

[1] The three awardees selected for continued financial assistance are identified in this synopsis and information on these proposed projects will be available on the DOE National Energy Technology Laboratory web site at http://www.netl.doe.gov/technologies/iccs/index.html.

Applications under the ICCS program were evaluated against specific programmatic criteria:

• Technology merit, technical plan, and site suitability;

• Project organization and project management plan;

• Commercial potential;

• Funding plan;

• Financial condition and capacity of proposed funding sources;

• Financial commitment to meet cost-sharing requirements.

These criteria represented the total evaluation scoring. However, the selection official also considered the results of the environmental evaluation and the applicant's budget information and financial management system, as well as program policy factors, in making selections.

As a federal agency, DOE must comply with NEPA (42 U.S.C. §§ 4321 *et seq*.) by considering potential environmental issues associated with its actions prior to deciding whether to undertake these actions. The environmental review of applications received in response to the ICCS FOA was conducted pursuant to Council on Environmental Quality Regulations (40 Code of Federal Regulations (CFR) Parts 1500 - 1508) and DOE's NEPA Implementing Procedures (10 CFR Part 1021), which provide directions specific to NEPA in the context of procurement and financial assistance actions.

PURPOSE AND NEED

The purpose and need for DOE's selections of awardees under the ICCS Program are to satisfy the responsibility Congress imposed on the Department to carry out a program to demonstrate technologies for the large-scale capture of CO_2 from industrial sources. Technology Area 1 under the FOA focused on the demonstration of advanced technologies that capture and sequester carbon dioxide emissions from industrial sources into underground formations or put the CO_2 to beneficial use in a manner that permanently prevents the CO_2 from entering the atmosphere, including the expansion of CO_2 use in EOR, while providing information on the cost and feasibility of deployment of sequestration technologies. Therefore, under the FOA, DOE sought projects with technologies that have progressed beyond the research and development stage to a point of readiness for operation at a scale that, if successful, could be readily replicated and deployed into commercial practice within the industry.

The industrial technologies proposed could produce heat, fuels, chemicals, hydrogen or other useful products with or without production of electricity. Thus, industrial sources could include cement plants, chemical plants, refineries, steel and aluminum plants, manufacturing facilities, and power plants using opportunity fuels (petroleum coke, municipal waste, etc.). DOE sought projects at a sufficient scale to show the potential for market penetration upon successful demonstration of the technology, and be integrated with commercial plant operation. DOE also allowed for leading-edge technologies not currently deployed in the utility marketplace or CO_2 injection industry, as opposed to new applications of commercial technologies or incremental improvements of commercial technologies or previously demonstrated technologies. DOE's specific technical objectives included demonstrating:

- Projects that capture and sequester amounts of CO_2 approaching or exceeding a target of one million tons per plant per year;
- Projects with large-scale CCS that include integration of CO_2 capture, transportation and sequestration with comprehensive MVA;
- Geological sequestration in multiple geological settings as a means to evaluate costs, operational processes, and technical performance;
- CO_2 capture technologies that are integrated within existing or new industrial facilities;

- Projects capable of operating technologies that make progress toward the capture and sequestration of seventy-five percent of CO_2 from the treated stream, comprising at least ten percent of CO_2 by volume that would otherwise be emitted to the atmosphere; and
- Projects at a sufficient scale to show the potential for market penetration;

ALTERNATIVES

DOE received eight Phase II renewal applications out of the twelve projects selected for Phase I in ICCS Technology Area 1, all of which were determined to have met the mandatory eligibility requirements listed in the FOA. The applications proposed projects located in eight states: California, Illinois, Kansas, Louisiana, Michigan, Mississippi, Texas, and Washington. The criteria for evaluating Phase II applications under ICCS Technology Area 1 were published in the FOA. Technical and financial evaluations represented the total evaluation scoring; however, the environmental evaluation, which was not point-scored, entered into the evaluation and selection process. Each applicant was required to complete and submit a standard environmental information volume for each site or alternative site included in its application.

The evaluations of the applications focused on the technical description of the proposed project, financial plans and budgets, potential environmental impacts, and other information that the applicants submitted. Following reviews by technical, environmental, and financial panels and a comprehensive assessment by a merit review board, a DOE official selected those applications that best met DOE's purpose and need. By broadly soliciting proposals to meet the programmatic purpose and need for DOE action and by evaluating the potential environmental impacts associated with each proposal before selecting applicants, DOE considered a reasonable range of alternatives for meeting its purpose and need.

Applications were divided into two broad categories:

- Group 1: Addition of Carbon Capture Equipment at an Existing and Operating Facility; and
- Group 2: Addition of Carbon Capture Equipment at a Planned or Yet-to-Be Constructed Facility.

DOE received five applications for existing and operating facilities (Group 1) and three applications for planned or yet-to-be constructed facilities (Group 2).

ENVIRONMENTAL REVIEW

DOE assembled environmental review teams to assess all applications that met the mandatory requirements. The review teams considered 20 resource areas that could potentially be impacted by the technologies and sites proposed under ICCS Technology Area 1. These resource areas consisted of:

- Aesthetics
- Air Quality
- Biological Resources
- Climate
- Community Services
- Cultural Resources
- Environmental Justice
- Floodplains
- Geology
- Ground Water
- Human Health and Safety
- Land Use
- Noise
- Socioeconomics
- Soils
- Surface Water
- Transportation and Traffic
- Utilities
- Wastes and Materials
- Wetlands

The review teams were composed of environmental professionals with experience evaluating the impacts of industrial facilities, power plants, and energy-related projects in the resource areas considered by DOE. The review teams considered the information provided as part of each application, which included narrative text, worksheets, and the environmental information volumes for the sites proposed by the applicant. In addition, reviewers independently verified the information provided to the extent practicable using available sources commonly consulted in the preparation of NEPA documents, and conducted preliminary analyses to identify the potential range of impacts that would be associated with each application. Reviewers identified both direct and indirect potential impacts to the resource areas mentioned above, as well as short-term impacts that might occur during construction and start-up, and long-term impacts that might occur over the expected operational life of the proposed project and beyond. The reviewers also considered any mitigation measures proposed by the applicant and any reasonably available mitigation measures that may not have been proposed.

Reviewers assessed the potential for environmental issues and impacts using the following characterizations:

- **Beneficial** – Expected to have a net beneficial effect on the resource in comparison to baseline conditions.
- **None (negligible)** – Immeasurable or negligible in consequence (not expected to change baseline conditions).
- **Low** – Measurable or noticeable but of minimal consequence (barely discernable change in baseline conditions).
- **Moderate** – Adverse and considerable in consequence but moderate and not expected to reach a level of significance (discernable, but not drastic, alteration of baseline conditions).
- **High** – Adverse and potentially significant in severity (anticipated substantial changes or effects on baseline conditions that might not be mitigable).

For cases in which an application failed to provide sufficient information to support a determination among the above characterizations, the reviewers assigned one of the following characterizations:

- **Limited Concern** – The potential for substantial adverse impacts would be negligible to low based on background information about the resource area with respect to the geographic location of the project.
- **Elevated Concern** – The potential for substantial adverse impacts would be moderate to high based on background information about the resource area with respect to the geographic location of the project.

Applications in Response to the FOA

Based on the technologies and sites proposed, none of the applications were deemed to have a high potential for adverse impacts in eighteen of the twenty resource areas. However, one application was considered to have potential for high adverse impacts to floodplains, with another having high potential for health and safety concerns. The following impacts by resource area were considered in the selection of candidates for award:

Aesthetics –Low to moderate impacts would be expected for one facility. This site would be located within view of a residential area; however, it would be located where a previous facility stood that posed similar aesthetic issues, leading to little relative change. Low impacts were projected for all remaining sites. Temporary impacts could result at one site due to construction of a CO_2 pipeline near a National Historic Trail.

Air Quality – Moderate impacts would be expected for five projects, with three of them having elevated concerns due to new sources of criteria pollutants from planned or yet-to-be constructed plants. The other

two facilities with expected moderate impacts would add new energy-generating systems to their plants as part of the project. Low impacts were anticipated for the remaining three projects. Concerns included increases in emissions of volatile organic compounds from four sites, increases in NO_x emissions from two sites, and increase in $PM_{2.5}$ and SO_2 emissions at one site. Temporary impacts from fugitive dust and combustion equipment were expected from all sites as a result of construction activities.

Biological Resources – Moderate impacts would be expected for four projects due to plant construction and land clearing activities. Impacts to aquatic species and habitat would be a concern for two projects as a result of process water intake, water discharge, and potential for accidental chemical release. Low impacts would be expected for the remaining sites.

Climate – Beneficial impacts would be expected for all projects as a result of greenhouse gas emissions reductions.

Community Services – Low impacts would be expected for all but one project, which would involve a new power plant. Generally, projects anticipating a larger temporary workforce during construction would be expected to place a higher demand on community services – particularly in smaller, more rural communities where currently existing community services are more limited.

Cultural Resources – Moderate impacts would be expected for two projects due to their proximity to multiple sites eligible for the National Register of Historic Places and other cultural resources. Low impacts would be expected for the remaining six projects. Potential impacts would include tribal concerns over pipeline routes. Impacts would vary with the extent of known tribal claims and their proximity to the proposed project or pipeline route.

Environmental Justice – Moderate impacts would be expected for one project due to the potential for disproportionate effects on minorities if an accidental release of hazardous chemical were to occur. Low impacts would be expected for the remaining projects, typically a function of lesser concentrations of low income and minority populations in surrounding areas.

Floodplains – Moderate to high impacts would be expected for three projects due to siting of the CO_2 capture facilities partially or totally within floodplains, and there would be limited concern for one site for which the floodplains are not delineated. Low to no impacts would be expected for the remaining proposed facilities. Low to moderate potential impacts during pipeline construction or pipeline routing would be expected for all but one project for which there are no floodplains within the proposed route. Floodplains would be impacted by any activity that modifies the available flood storage within the designated area; however, long-term potential impacts on the corridors would be minimal provided the surface contours are returned to preconstruction conditions.

Geology –Moderate impacts would be expected at one project due to sequestration within a rock formation largely untested for storage effectiveness. One project alternative presents elevated concern as it has potential for caprock fracture combined with abnormally high levels of hydrogen sulfide (H_2S) in the formation water. The potential for low to moderate impacts exists for all applications, either from CO_2 injection into saline aquifers or use for enhanced oil recovery.

Ground Water – Low impacts would be expected for all projects. Impacts could include displacement of saline waters in reservoirs targeted for CO_2 injection or loss of CO_2 containment should injection pressures exceed appropriate thresholds.

Human Health and Safety – Low to moderate impacts would be expected for all projects due to hazards associated with construction. The level of risk is generally related to the size and complexity of the planned construction. There could also be a risk to human health and safety from loss of containment of CO_2 during transport and injection. This risk is present for all applications and generally varies from low to moderate with distance and is influenced by population density along the CO_2 transport route. Shorter routes through sparsely populated areas were considered to have a lower risk than longer routes through

regions of higher population. Low to moderate potential impacts could also be expected resulting from hazards associated with use, storage, and transport of ammonia for the CO_2 capture process. One project has a high potential impact due to the proximity of CO_2 pipelines to seismic faults and potential fracturing.

Land Use – Low impacts would be expected for all projects.

Noise – Moderate temporary impacts would be expected during construction of the pipeline routes for two projects that would pass near sensitive receptors. Long-term impacts during operations would be expected to be low for all projects.

Socioeconomics – Beneficial impacts would be expected for all projects. All projects would provide some additional employment as a result of construction, operations, and multiplier effects. Most employment opportunities would be in the local area.

Soils – Low impacts would be expected for projects located on previously disturbed land or within proximity to other industrial facilities. Moderate impacts would be expected for those projects with disturbances to prime farmland soils. One project would be located on a brownfield site, requiring additional remediation.

Surface Water – Moderate impacts would be expected for four projects due to proposed pipeline crossings of numerous streams and other water bodies, including one project where the pipeline crosses a major river. Moderate impacts would also be expected for two of the projects due to increased water demand. Low impacts would be expected for the remaining four projects. Increased sediment and nutrient loadings associated with increased stormwater runoff would be a concern for all projects.

Transportation and Traffic – Low impacts would be expected for all projects. Temporary impacts from construction are likely; however, operations would not be expected to result in any long-term traffic problems.

Utilities – Moderate impacts would be expected for five projects, associated with the supply of electricity for the CO_2 capture and compression systems. Low impacts would be expected for the remaining three projects.

Wastes and Materials – Low to moderate impacts would be expected for all projects due to required materials used and waste generated during operations of the CO_2 capture facilities, and wastes generated during construction, typically proportional to the size of the project.

Wetlands –Low impacts would be expected for all projects but one, which would have moderate impacts from more extensive wetland clearing as a result of CO_2 pipeline construction and ROW clearing.

CONCLUSION

The alternatives available to DOE from applications received in response to the FOA for ICCS Technology Area I provided reasonable alternatives for accomplishing the Department's purpose and need to satisfy the responsibility Congress imposed on the Department to carry out a program to demonstrate technologies for the large-scale capture of CO_2 from industrial sources. The alternatives available to DOE would also meet the Department's goal of demonstrating advanced technologies that capture CO_2 emissions from industrial sources and either sequester the CO_2 in underground formations or put the CO_2 to beneficial use that permanently prevents it from entering the atmosphere. An environmental review was part of the evaluation process of these applications. DOE prepared a critique containing information from this environmental review. That critique, summarized here, contained summary as well as project-specific environmental information. The critique was made available to, and considered by, the selection official before selections for financial assistance were made.

DOE determined that selecting three applications in response to the FOA Technology Area 1 would meet the Department's purpose and need. DOE selected three projects for awards of financial assistance:

- Archer Daniels Midland Company (Decatur, IL) – project location in Decatur, IL. CO_2 capture from biofuels production and sequestration in the Mt. Simon sandstone formation; DOE determined that an environmental assessment is the appropriate level of environmental review for the proposed project.
- Air Products & Chemicals, Inc. (Allentown, PA) – project location in Port Arthur, TX. CO_2 capture from steam methane reforming process and transport to the Denbury Green Pipeline for use in EOR; DOE determined that an environmental assessment is the appropriate level of environmental review for the proposed project.
- Leucadia Energy, LLC (New York, NY) – project location in Lake Charles, LA. CO_2 capture from flue gas from yet-to-be constructed petroleum coke gasification plant and transport to the Denbury Green Pipeline for use in EOR; DOE determined that an environmental impact statement is the appropriate level of environmental review for the proposed project.

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APPENDIX B

US ARMY CORPS OF ENGINEERS PERMITS ISSUED TO THE PORT OF LAKE CHARLES FOR THE GASIFICATION SITE

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DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF

May 30, 2008

LC Lease file
Sharon -

Real Estate Division
Management, Disposal and Control Branch

Lake Charles Harbor & Terminal District
Post Office Box 3753
Lake Charles, Louisiana 70602

Gentlemen:

Enclosed for your records is a fully executed copy of Department of the Army Consent No. DACW29-9-08-43, which permits clearing, grubbing, and grading an area, depositing fill material and constructing a bulkhead for a coke gasification plant, within our Calcasieu River and Pass Channel Improvement Project, in Calcasieu Parish, Louisiana.

Your cooperation regarding this matter is greatly appreciated.

Sincerely,

Linda C. LaBure
Chief, Real Estate Division

Enclosure

JUN 2008
RECEIVED

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NO. DACW29-9-08-43

DEPARTMENT OF THE ARMY
CONSENT TO CROSS U. S. GOVERNMENT EASEMENT
AT
CALCASIEU RIVER & PASS CHANNEL IMPROVEMENT PROJECT
CALCASIEU PARISH, LOUISIANA

KNOW ALL MEN BY THESE PRESENTS:

That the consent of the United States is hereby granted to **Lake Charles Harbor & Terminal District,** hereinafter designated as grantee, to use, control, operate, and/or otherwise clear, grub and grade an area, deposit fill material and construct a bulkhead for a coke gasification plant, herein referred to as a "structures", across, over and under the lands where the United States has acquired perpetual channel and spoil disposal easements, identified as Tract Nos. 90 E-2 and 159E, within our Calcasieu River and Pass Project; and which is recorded in Deed Book of Conveyance No. 812, File No. 878180, Page 577, dated April 26, 1962 and File No. 1039993, dated October 13, 1966, respectively in the records of Calcasieu Parish, Louisiana. The approximate right-of-way for said structure for the purpose of this consent is specifically identified as Parcel in yellow, located as shown on Exhibit "A" attached hereto and made a part hereof and described as follows:

The installation and/or activity will be located on U.S. Government Tract Nos. 90 E-2 and 159E, Section 17, Township 10 South, Range 9 West, Calcasieu Parish, Louisiana.

This consent is granted subject to the following conditions:

1. That it is understood that this consent is effective only insofar as the property rights of the United States in the land to be occupied are concerned, and that it does not relieve the grantee from the necessity of obtaining grants from the owners of the fee and/or other interests therein.

2. That the proposed construction authorized herein shall not be commenced until appropriate rights shall have been obtained by the grantee from the record owners and encumbrances of the fee title to the lands involved.

3. That the exercise of the privileges hereby consented to shall be without cost or expense to the Department of the Army, under the general supervision and subject to the approval of the officer having immediate jurisdiction over the property, hereinafter referred to as "said officer," and subject to such regulations as may be prescribed by the District Commander, New Orleans District, from time to time, including, but not limited to, the specific conditions, requirements and specifications set forth in Exhibit "B" attached hereto and made a part hereof.

4. That the grantee shall supervise and maintain the said structure (or activity) and cause it to be inspected at reasonable intervals, and shall immediately repair any damage found therein as a result of such inspection, or when requested by said officer to repair any defects. Upon completion of the installation of said structure (or activity) or the making of any repairs thereto, the premises shall be restored immediately by the grantee, at the grantee's own expense, to the same condition as that in which they existed prior to the commencement of such work, to the satisfaction of said officer.

5. That any property of the United States damaged or destroyed by the grantee incident to the exercise of the privileges herein granted shall be promptly repaired or replaced by the grantee to the satisfaction of the said officer, or in lieu of such repair or replacement, the grantee shall, if so required by the said officer and at his option, pay to the United States money in an amount sufficient to compensate for the loss sustained by the United States by reason of damage to or destruction of Government property.

6. That the United States shall not be responsible for damages to property or injuries to persons which may arise from or be incident to the exercise of the privileges herein granted, or for damages to the property of the grantee, or for damages to the property or injuries to the person of the grantee, or the persons of grantee's officers, agents, servants, or employees or others who may be on said premises at their invitation or the invitation of one of them arising from governmental activities on or in the vicinity of the said premises, and the grantee shall hold the United States harmless from any and all such claims.

7. That this consent is effective only as to the following rights of the United States in the lands hereinabove described.

8. That the United States shall in no case be liable for any damage or injury to the construction herein authorized which may be caused by any action of the Government, under the rights obtained in its easements, either hidden or known, or that may result from future operations under taken by the Government, and no claim or right to compensation shall accrue from such damage or injury, and if further operations of the United States require the alteration or removal of the structure (or activity) herein authorized, the grantee shall, upon due notice from the Chief of Engineers, Department of Army, alter or remove said structure (or activity) without expense to the Government and subject to the supervision and approval of the officer having jurisdiction over the property and no claim for damages shall be made against the United States on account of such alterations or removal.

9. That construction and/or operation maintenance and use of said structure (or activity) incident to the exercise of the privileges hereby granted shall be in such a manner as not to conflict with the rights of the Government, nor to interfere with the operations by the Government under such rights, nor to endanger lives and safety of the public.

10. That this consent may be terminated by the Secretary of the Army upon reasonable notice to the grantee if the Secretary of the Army shall determine that installation to which consent is hereby granted interferes with the use of said land or any part thereof by the United States, and this consent may be annulled and forfeited by the declaration of the Secretary of the Army for failure to comply with any and all of the provisions and conditions of this consent, or for nonuse for a period of two years, or for abandonment.

11. That upon the relinquishment, termination, revocation, forfeiture or annulment of the consent herein granted, the grantee shall vacate the premises, remove all property of the grantee therefrom, and restore the premises to a condition satisfactory to the officers having immediate jurisdiction over the property. If the grantee shall fail or neglect to remove said property and so restore the premises, then, at the option of the Secretary of the Army, the said property shall either become the property of the United States without compensation therefor, or the Secretary of the Army may cause it to be removed and the premises to be so restored at the expense of the grantee, and no claim for damages against the United States, or its officers or agents, shall be created by or made on account of such removal and restoration.

12. That the terms and conditions of this consent shall extend to and be binding upon the heirs, successors and assigns of the grantee. Without prior written approval by said District Commander, the grantee of this Consent shall neither transfer nor assign the rights granted herein, or any part thereof.

13. That the grantee within the limits of his respective legal powers shall comply with all Federal, interstate, state and/or local governmental regulations, conditions or instructions for the protection of the environment and all other matters as they relate to real property interests granted herein.

14. That the grantee shall not remove or disturb, or cause or permit to be removed or disturbed, any historical, archeological, architectural or other cultural artifacts, relics, vestiges, remains or objects of antiquity. In the event such items are discovered on the premises, the grantee shall immediately notify the District Commander, New Orleans District, and the site and the material shall be protected by the grantee from further disturbance until a professional examination of them can be made or until clearance to proceed is authorized by the District Commander.

15. Except as otherwise specifically provided, any reference herein to "Secretary", "District Commander", "Installation Commander", or "said officer" shall include their duly authorized representatives. Any reference to "grantee" shall include assignees, transferees and their duly authorized representatives.

16. Merger clause. Prior to the execution of this consent, the following conditions were deleted: **None**; changed: **None**; or added: **None.**

This consent is not subject to Title 10, U.S.C., Section 2662.

In Witness Whereof, I have hereunto set my hand, by authority of the Secretary of the Army this 30th day of May, 2008.

Witness

LINDA G. THOMPSON
Printed Name

Witness

Dorothy Cooper
Printed Name

LINDA C. LABURE
Chief, Real Estate Division
U.S. Army Corps of Engineers
New Orleans District

THIS CONSENT is also executed by the grantee this 28th day of May 20 08.

LAKE CHARLES HARBOR & TERMINAL DISTRICT

Linda S. Manuel
Witness

LINDA S. MANUEL
Printed Name

Sharon Edwards
Witness

SHARON EDWARDS
Printed Name

Typed Name: R. ADAM McBRIDE

Title: PORT DIRECTOR

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CERTIFICATE OF AUTHORITY

I, MICHAEL K. DEES, do hereby certify that I am the principle legal officer of **Lake Charles Harbor and Terminal District (LCHTD)** and that **LCHTD** is a legally constituted public body with full authority and legal capability to adhere and comply with the terms and conditions of **Consent No. DACW29-9-08-43** and subsequent amendments thereto, to construct and maintain a new drainage pump station and appurtenant structures in connection with the Gulf Intracoastal Waterway: Bourg Canal to Bayou Chene Project, and that the persons who executed **Consent No. DACW29-9-08-43,** on behalf of **LCHTD** has acted within their statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification on this 15th day of May, 2008.

Signed: _____

Printed name: MICHAEL K. DEES

Title: General Counsel

ACKNOWLEDGMENT

STATE OF LOUISIANA

COUNTY/PARISH OF CALCASIEU

On this 28th day of May, 2008, before me appeared R. ADAM McBRIDE, to me personally known, who, being by me duly sworn, did say that he is the PORT DIRECTOR of Lake Charles Harbor and Terminal District (LCHTD) and that the Consent was signed on behalf of LCHTD, by authority duly and legally granted and bestowed upon him, and that HE acknowledged the Consent to be the free act and deed of LCHTD and LCHTD has no seal.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

Signed: _____

Printed Name: MICHAEL K DEES

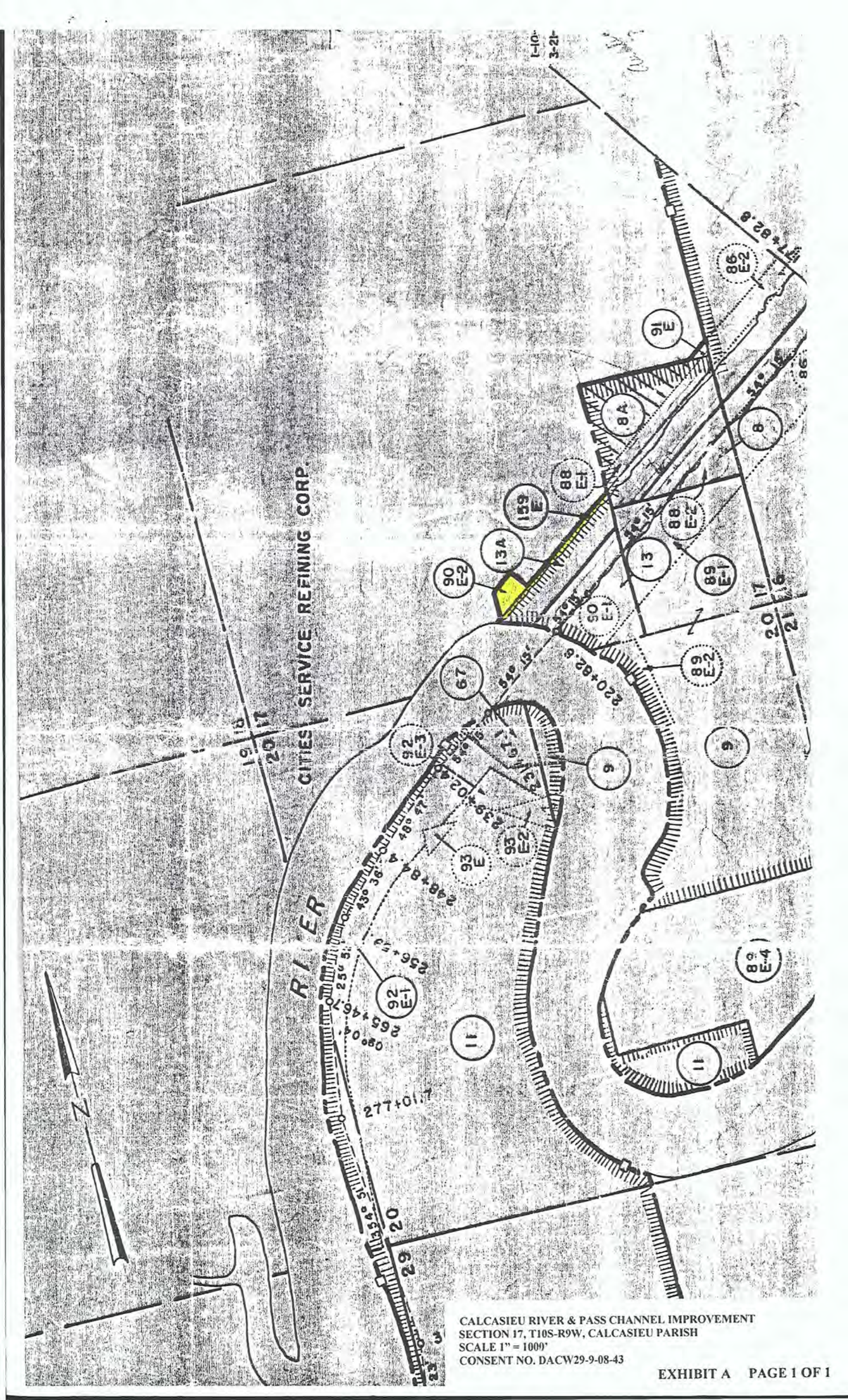
Notary Public
State of Louisiana
Parish of CALCASIEU

My Commission Expires: upon my death

Bar Association Number: _____

OFFICIAL SEAL

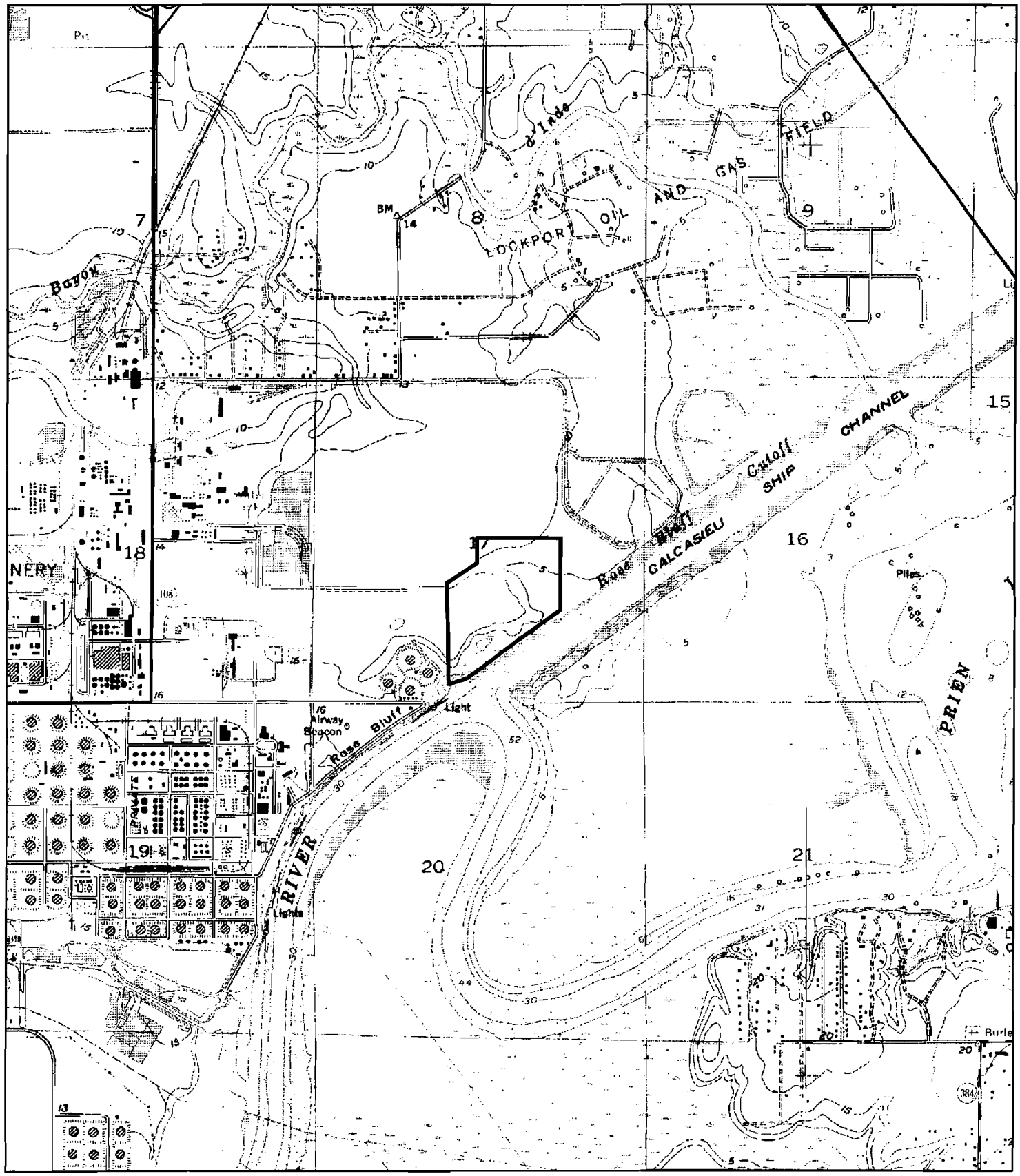
MICHAEL K. DEES
LOUISIANA BAR NO. 04796
NOTARY PUBLIC NO. 2630
STATE OF LOUISIANA
PARISH OF CALCASIEU
MY COMMISSION IS FOR LIFE



CALCASIEU RIVER & PASS CHANNEL IMPROVEMENT
SECTION 17, T10S-R9W, CALCASIEU PARISH
SCALE 1" = 1000'
CONSENT NO. DACW29-9-08-43

EXHIBIT A PAGE 1 OF 1

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PROJECT LOCATION

ARABIE ENVIRONMENTAL SOLUTIONS

FIGURE 1 OF 4

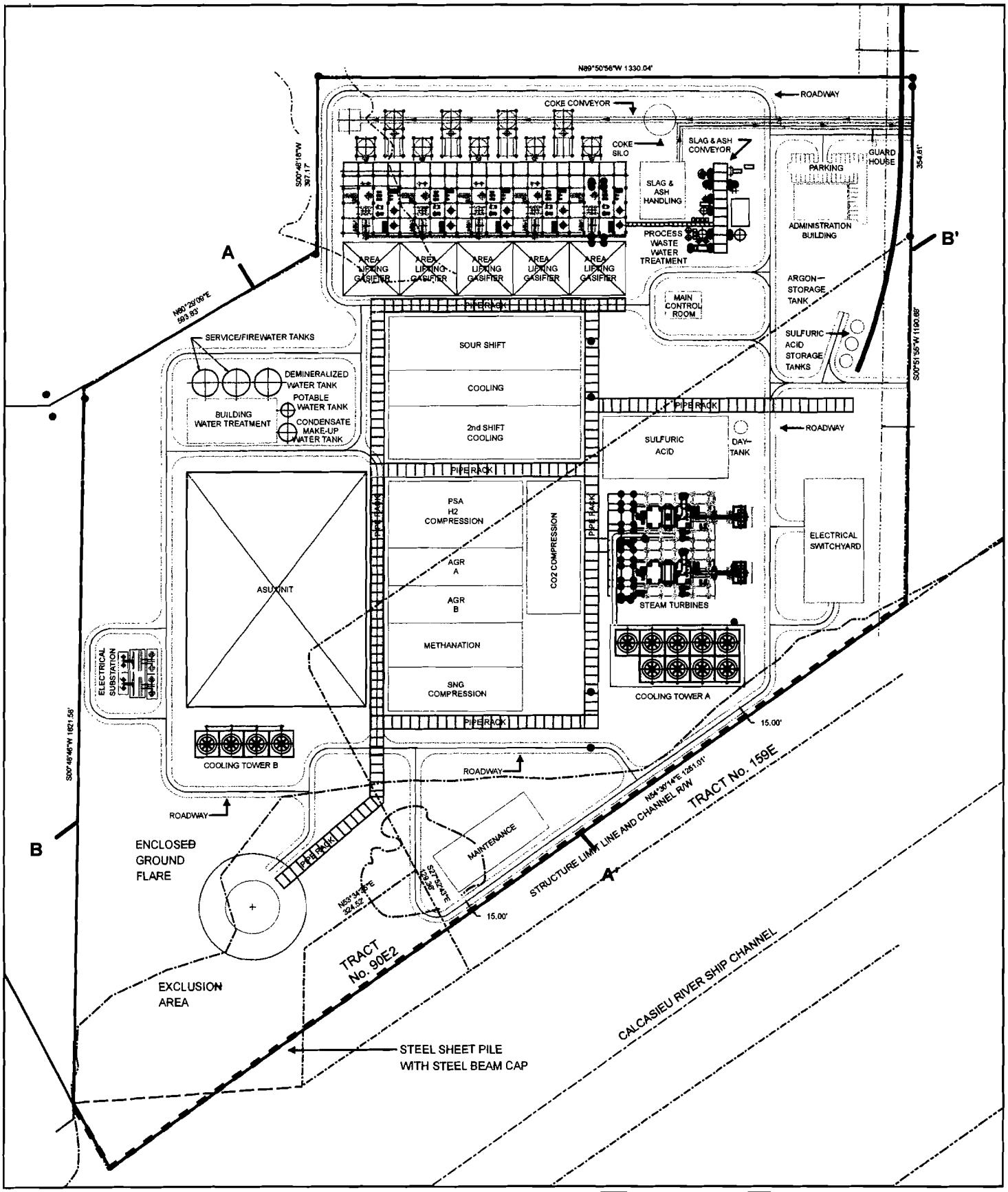
SITE LOCATION MAP

PERMIT APPLICATION
LAKE CHARLES HARBOR AND TERMINAL DISTRICT
LAKE CHARLES COGEN SITE
WESTLAKE, LOUISIANA

Drawn By:	RSK	Checked By:	RRB
Date:	09/18/2007	Drawing No.:	10779-1

CONSENT NO. DACW29-9-08-43

EXHIBIT B



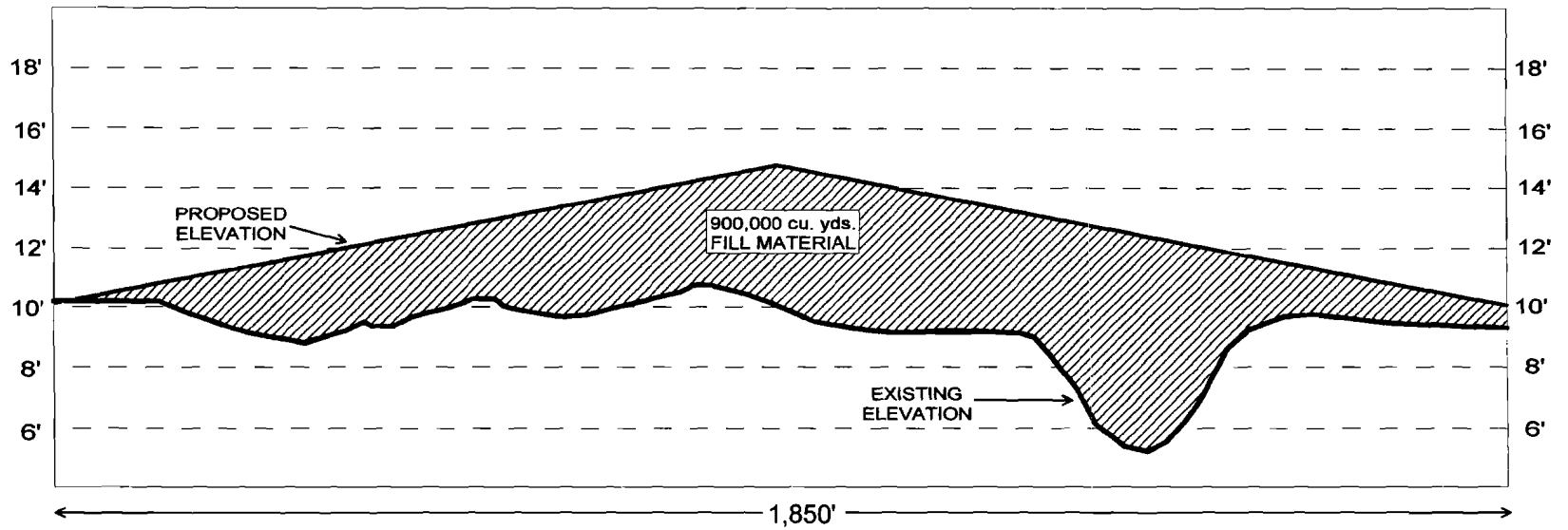
APPROXIMATE SCALE

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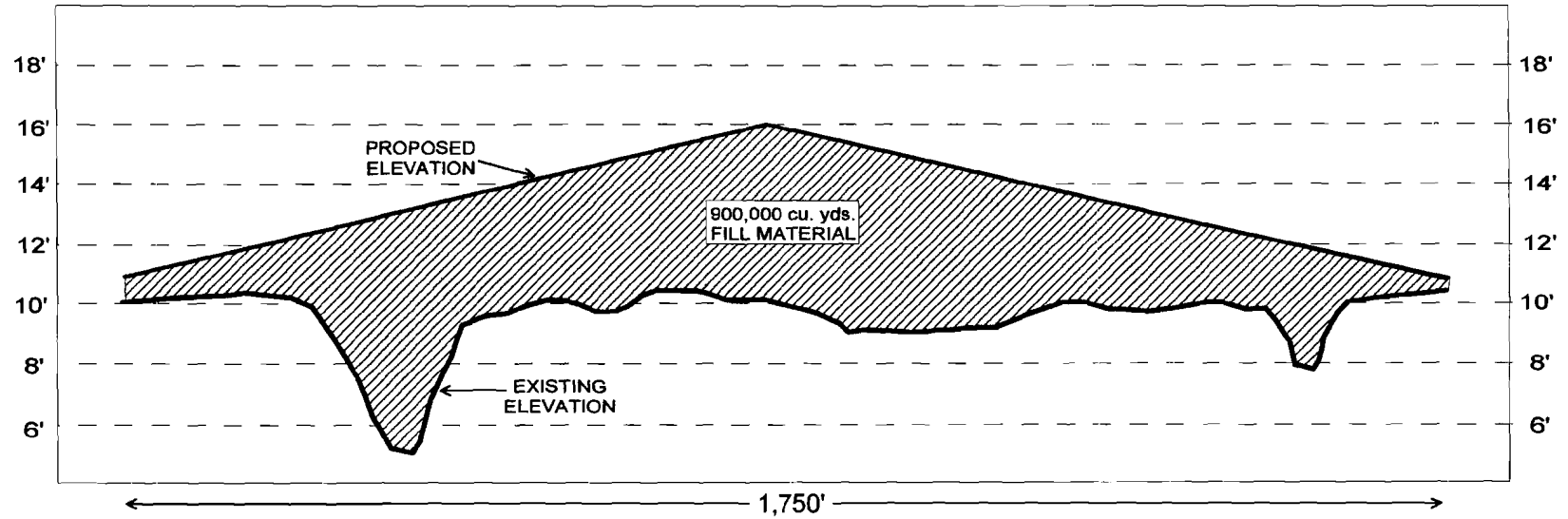
ARABIE ENVIRONMENTAL SOLUTIONS

FIGURE 2 OF 4
SITE DIAGRAM
PERMIT APPLICATION
LAKE CHARLES HARBOR AND TERMINAL DISTRICT
LAKE CHARLES COGEN SITE
WESTLAKE, LOUISIANA

Drawn By:	RSK	Checked By:	RRB
Date:	09/18/2007	Drawing No.:	10779-2



SECTION A-A'



SECTION B-B'

FILL MATERIAL

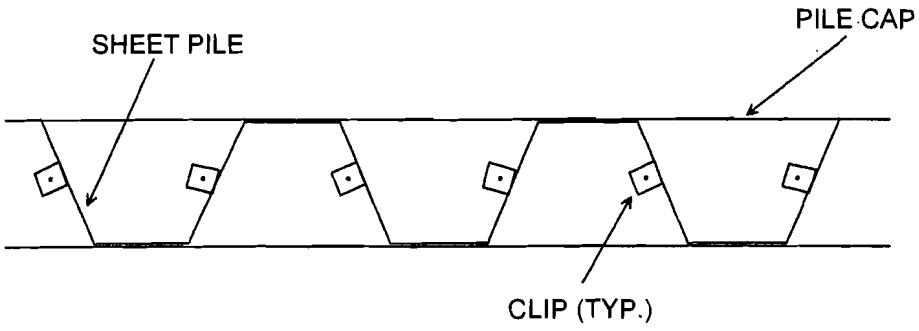
NOTES: 1) SLOPE OF PROPOSED ELEVATION = 0.5%
2) FILL MATERIAL WILL RESULT IN A MEAN RISE IN ELEVATION OF +/- 8'.

NOT TO SCALE
DIMENSIONS AS NOTED

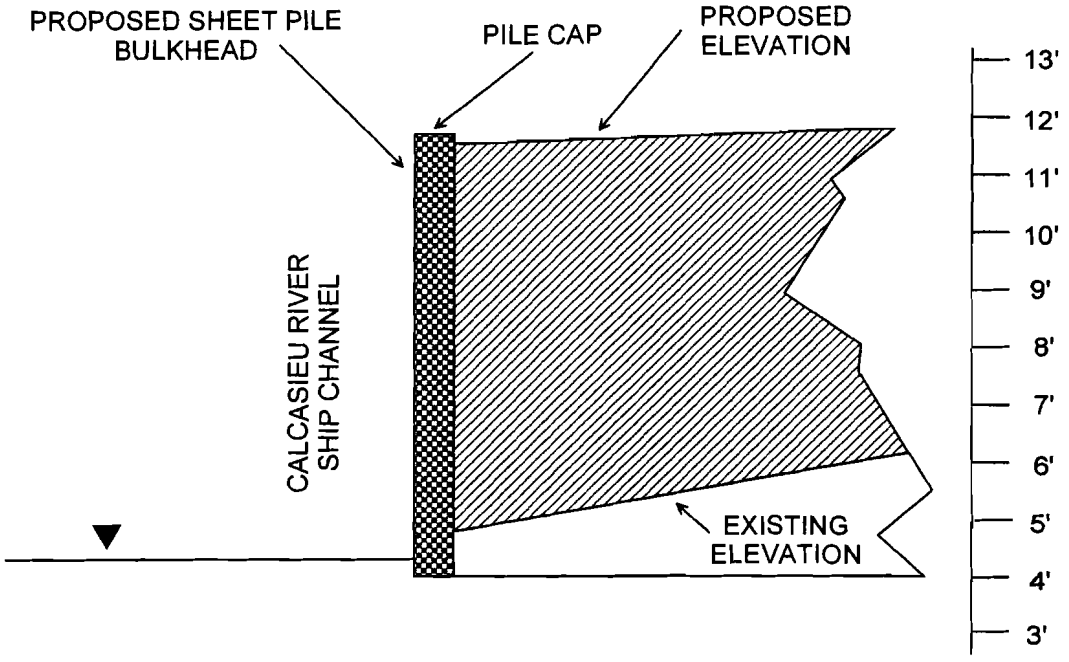
ARABIE ENVIRONMENTAL SOLUTIONS

FIGURE 3 OF 4
CROSS SECTIONS
PERMIT APPLICATION
LAKE CHARLES HARBOR AND TERMINAL DISTRICT
LAKE CHARLES COGEN SITE
WESTLAKE, LOUISIANA

Drawn By:	RSK	Checked By:	RRB
Date:	09/20/2007	Drawing No:	10779-3



PLAN VIEW FOR SHEET PILE BULKHEAD



CROSS SECTIONAL VIEW OF SHEET PILE BULKHEAD

CONSENT NO. DACW29-9-08-43

EXHIBIT B **PAGE 4 OF 4**

NOT TO SCALE

FILL MATERIAL

NOTE: Max Water Levels = +1.2'
Min Water Levels = -1.2'

ARABIE ENVIRONMENTAL SOLUTIONS

FIGURE 4 OF 4
BULKHEAD CROSS SECTIONS
PERMIT APPLICATION
LAKE CHARLES HARBOR AND TERMINAL DISTRICT
LAKE CHARLES COGEN SITE
WESTLAKE, LOUISIANA

Drawn By:	*RSK*	**Checked By:**	*RRB*
Date:	*09/28/2007*	**Drawing No:**	*10779-4*

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

AUG 1 8 2008

Operations Division
Western Evaluation Section

SUBJECT: MVN-1998-03311-WY

Lake Charles Harbor & Terminal District
Post Office Box 3753
Lake Charles, Louisiana 70602

Gentlemen:

Revised drawings enclosed in six sheets, furnished with your Department of the Army application dated September 28, 2007, requesting authorization to perform construction operations to include clearing, excavating, grading, and placing fill and installing and maintaining a shoreline protection bulkhead, all as required to implement a coke gasification plant at Lake Charles, Louisiana, in Calcasieu Parish, are approved and will supersede the plans for the work authorized by the Secretary of the Army in a permit dated January 24, 2000.

A copy of this approval must be conspicuously displayed at the site of work.

The time limit for completion of this work is extended to August 30, 2013.

The following conditions are added to the permit:

1. Your use of the permitted activity must not interfere with the public's right to free navigation on all navigable waters of the United States.

2. The permittee is aware that unless lighted and marked the proposed excavation equipment and production facilities may present a hazard to recreation and/or commercial navigation in the area. Therefore, proper lighting and marking of these facilities and equipment to insure avoidance by these entities is required. Adequate lighting and marking will be installed, at the expense of the permittee, in relation to the facilities and equipment as necessary and customary unless otherwise prescribed by the U.S. Coast Guard, through regulations and other guidelines.

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RECEIPT OR COLLECTION VOUCHER

DATE: 8/11/08

RECEIVED FROM: Arabie Environmental Solutions Inc

THE SUM OF One Hundred DOLLARS/AND XX/100 CENTS

($ 100.00) FOR THE FOLLOWING:

	AMOUNT
PERMITTEE: Lake Charles Harbor & Terminal	100.00
PERMIT NUMBER: MVN 1998-03311-WY	
CHECK NUMBER: 2722 DATED: 8/5/08	
TOTAL AMOUNT:	100.00

RECEIVED BY: Office Automation Clerk

8/11/08
Date

3. You must install and maintain, at your expense, any safety lights, signs, and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, on your authorized facilities.

4. If the proposed project, or future maintenance work, involves the use of floating construction equipment (barge mounted cranes, barge mounted pile driving equipment, floating dredge equipment, dredge discharge pipelines, etc.,) in the waterway, you are advised to notify the U.S. Coast Guard, Marine Safety Office, Waterways Management Section so that a Notice to Mariners, if required, may be prepared. Notification, with a copy of the permit and drawings, should be mailed to the Commander (oan), Eighth Coast Guard District, ATTN: Marine Information Branch, 501 Magazine Street, New Orleans, Louisiana 70130-3396, about one month prior to commencement of work. Telephone inquiries can be directed to (504) 589-6277.

5. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

6. Many local governing bodies have instituted laws and/or ordinances in order to regulate dredge and/or fill activities in floodplains to assure maintenance of floodwater storage capacity and avoid disruption of drainage patterns that may affect surrounding properties. Your project involves dredging and/or placement of fill, therefore, you must contact the local municipal and/or parish governing body regarding potential impacts to floodplains and compliance of your proposed activities with local floodplain ordinances, regulations or permits.

7. **Our Real Estate Division has indicated that your project is located in an area over which the federal government holds a real estate interest. No work may be performed under this permit until a real estate instrument has been issued by our Real Estate Division. If you require further information regarding the Real Estate instrument, call (504) 862-1956.**

If the structure or work authorized is not completed on or before the date herein specified, this authorization, if not previously revoked or specifically further extended, will cease and become null and void.

We ask that you utilize the following link to complete and submit a Customer Service Survey: **http://per2.nwp.usace.army.mil/survey.html**. The New Orleans District Regulatory Branch is committed to improving our service to you and would like your honest opinions of how we are doing. If you do not have internet access you may request a hard copy of the Customer Service Survey by calling (504) 862-2257. Your input is important to us, thank you for your time.

BY AUTHORITY OF THE SECRETARY OF THE ARMY:



Pete J. Serio
Chief Regulatory Branch
for
Alvin B. Lee
Colonel, US Army
District Commander

Enclosures

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PROJECT LOCATION

0 750 1,500 3,000 4,500 6,000 Feet

ARABIE ENVIRONMENTAL SOLUTIONS

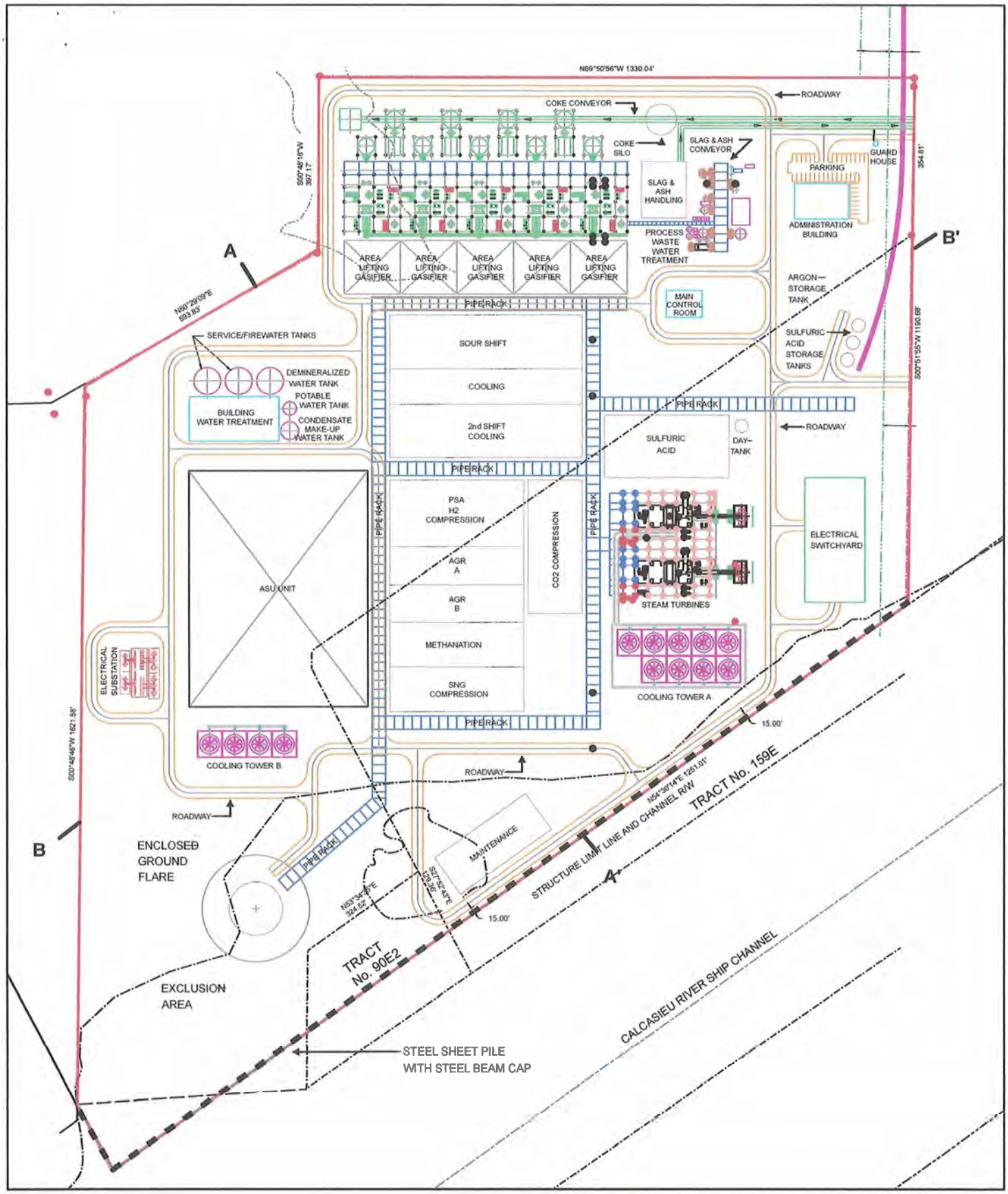
FIGURE 1 OF 4

SITE LOCATION MAP

PERMIT APPLICATION
LAKE CHARLES HARBOR AND TERMINAL DISTRICT
LAKE CHARLES COGEN SITE
WESTLAKE, LOUISIANA

Drawn By:	RSK	Checked By:	RRB
Date:	09/18/2007	Drawing No.:	10779-1

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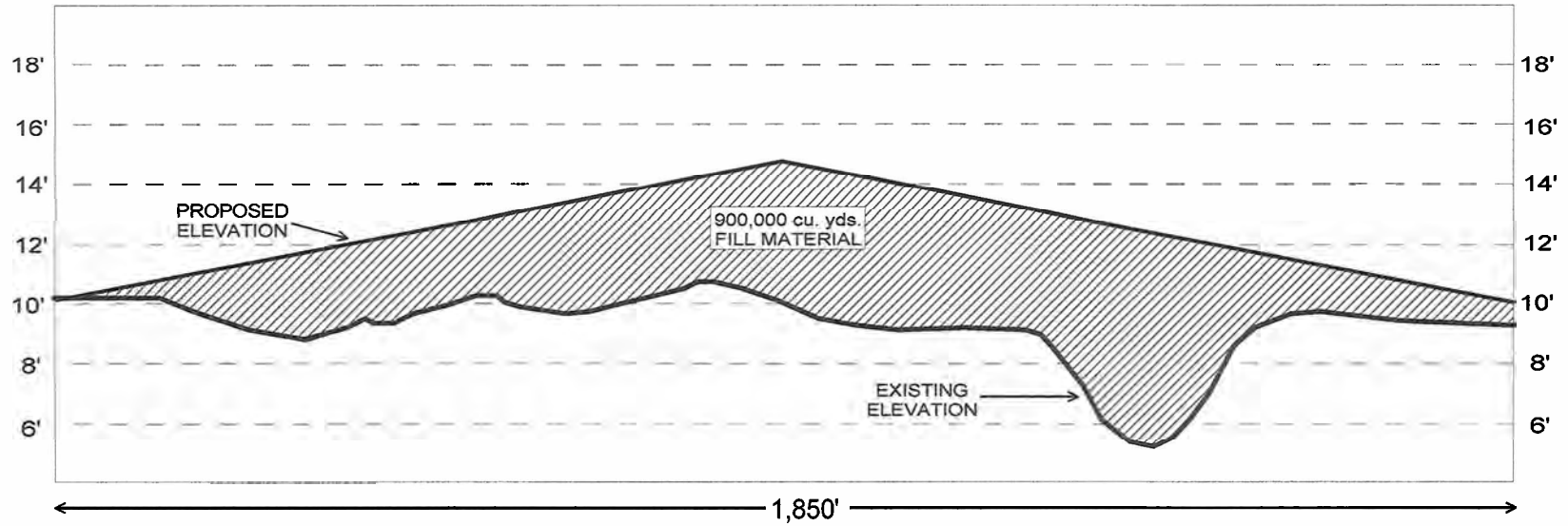
APPROXIMATE SCALE
1" = 300'

ARABIE ENVIRONMENTAL SOLUTIONS

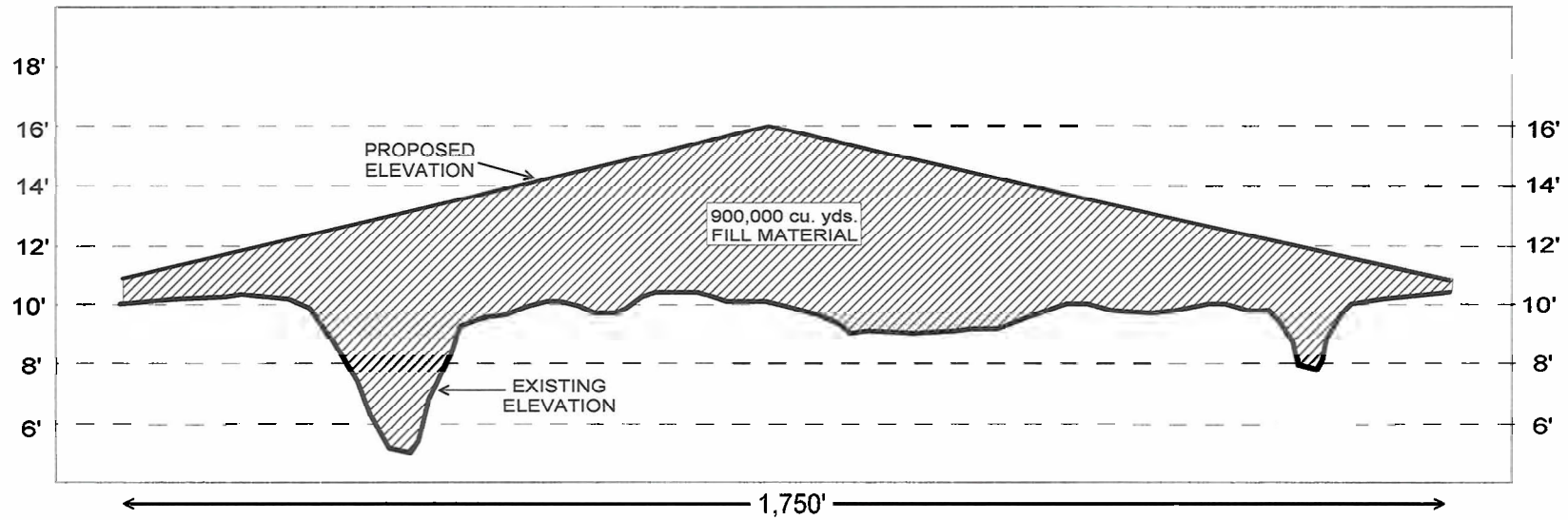
FIGURE 2 OF 4
SITE DIAGRAM
PERMIT APPLICATION
LAKE CHARLES HARBOR AND TERMINAL DISTRICT
LAKE CHARLES COGEN SITE
WESTLAKE, LOUISIANA

Drawn By:	RSK	Checked By:	RRB
Date:	09/18/2007	Drawing No.:	10779-2

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SECTION A-A'



SECTION B-B'

FILL MATERIAL

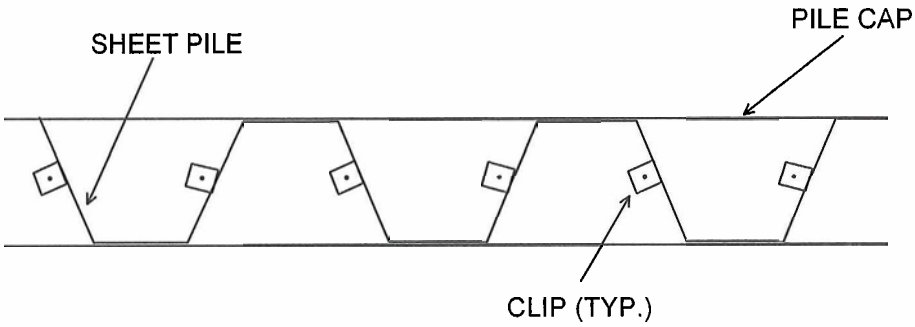
NOTES: 1) SLOPE OF PROPOSED ELEVATION = 0.5%
2) FILL MATERIAL WILL RESULT IN A MEAN RISE IN ELEVATION OF +/- 8'.

NOT TO SCALE
DIMENSIONS AS NOTED

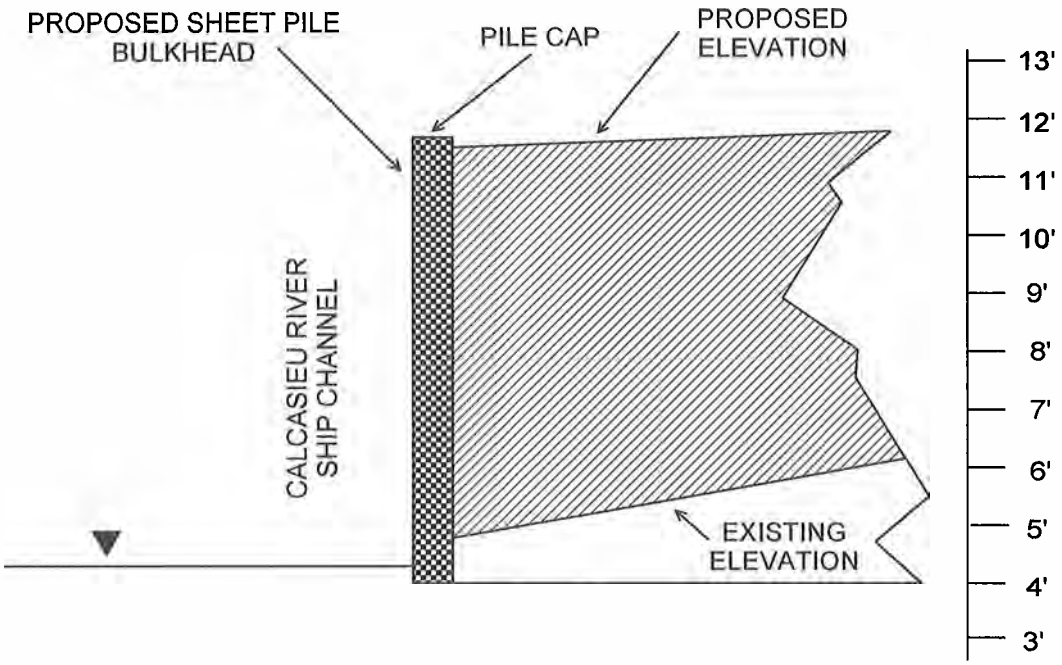
ARABIE ENVIRONMENTAL SOLUTIONS

FIGURE 3 OF 4
CROSS SECTIONS
PERMIT APPLICATION
LAKE CHARLES HARBOR AND TERMINAL DISTRICT
LAKE CHARLES COGEN SITE
WESTLAKE, LOUISIANA

Drawn By:	RSK	Checked By:	RRB
Date:	09/20/2007	Drawing No:	10779-3



PLAN VIEW FOR SHEET PILE BULKHEAD



CROSS SECTIONAL VIEW OF SHEET PILE BULKHEAD

NOT TO SCALE

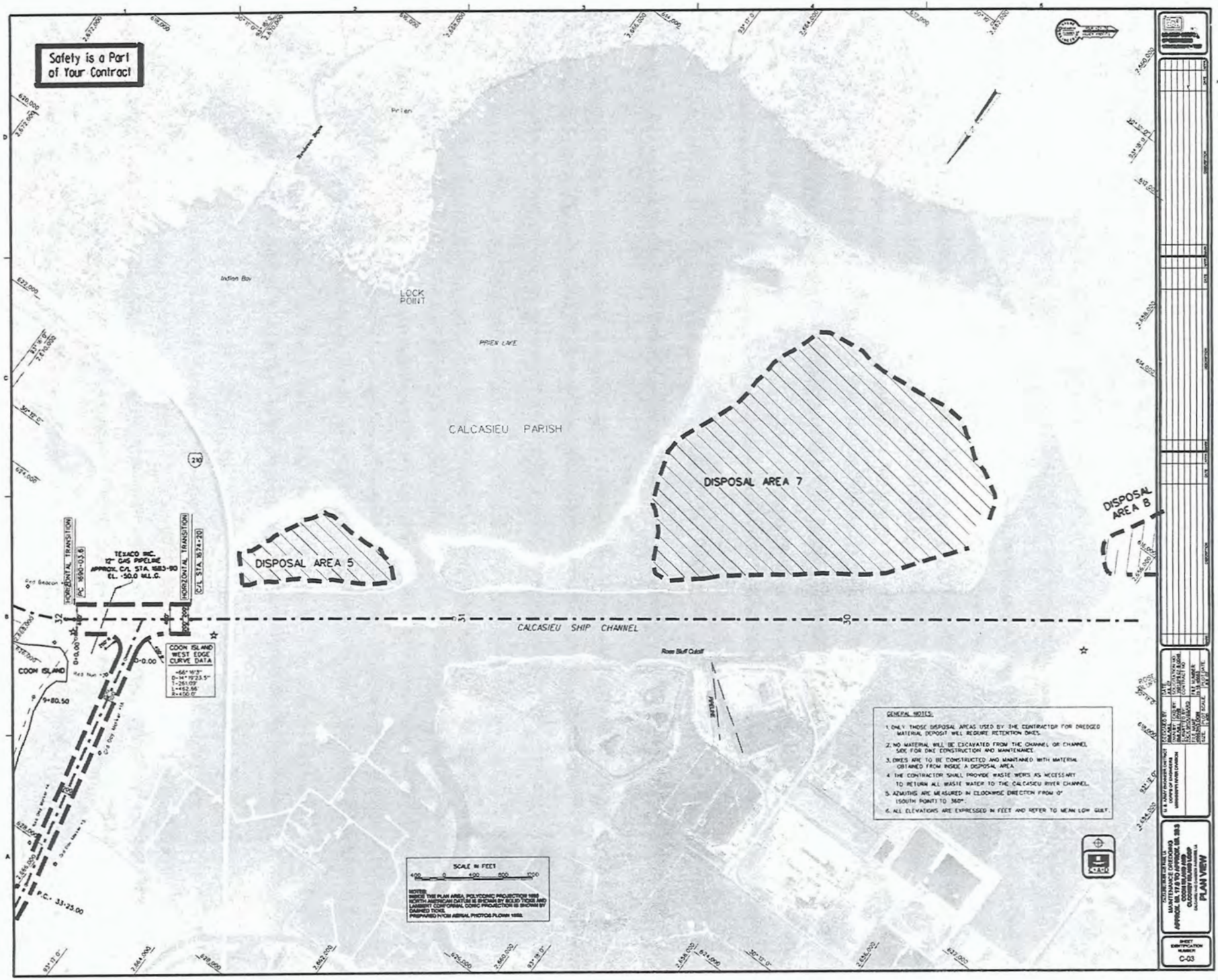
FILL MATERIAL

NOTE: Max Water Levels = +1.2'
Min Water Levels = -1.2'

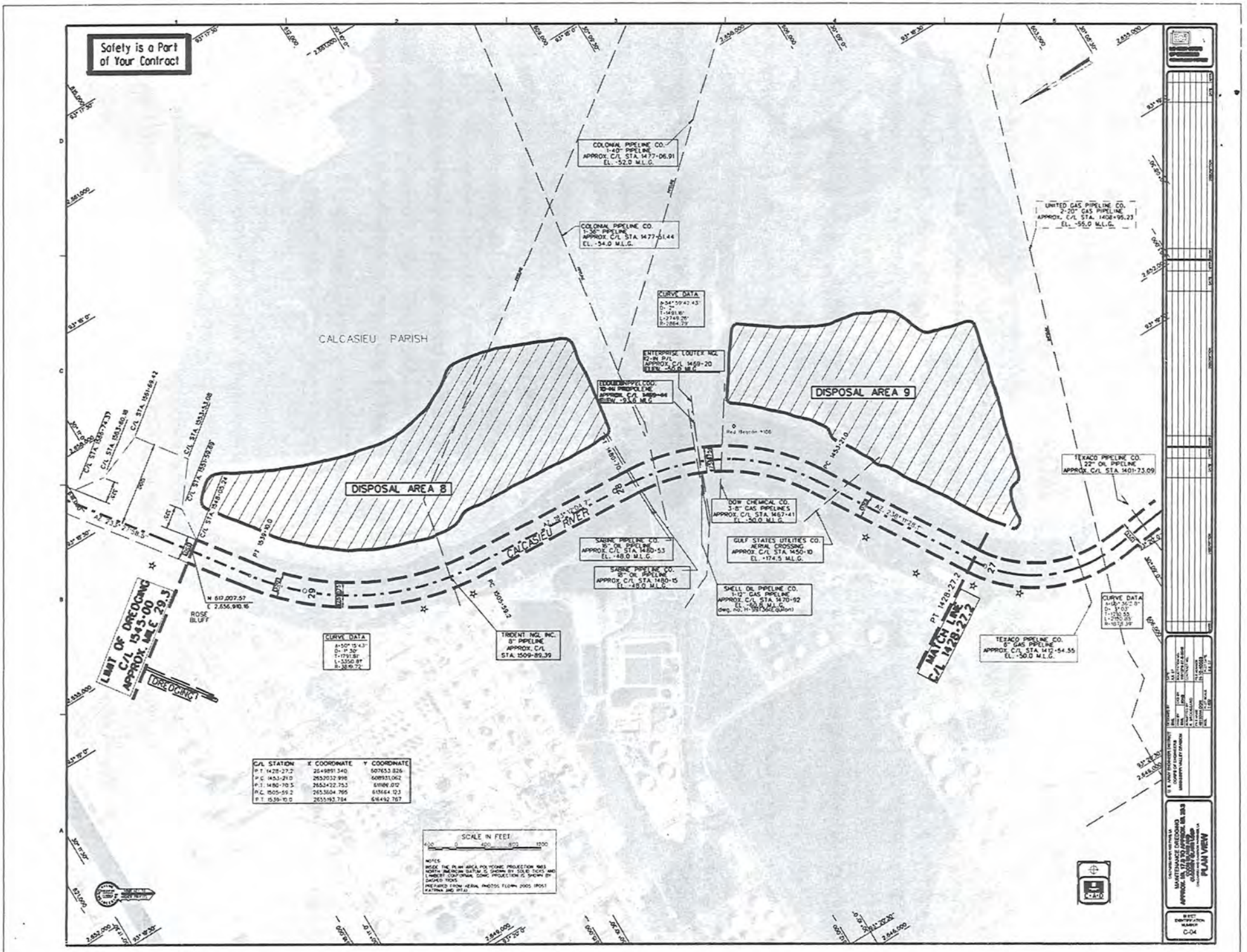
ARABIE ENVIRONMENTAL SOLUTIONS

FIGURE 4 OF 4
BULKHEAD CROSS SECTIONS
PERMIT APPLICATION
LAKE CHARLES HARBOR AND TERMINAL DISTRICT
LAKE CHARLES COGEN SITE
WESTLAKE, LOUISIANA

Drawn By:	*RSK*	**Checked By:**	*RRB*
Date:	*09/28/2007*	**Drawing No:**	*10779-4*



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C/L STATION	X COORDINATE	Y COORDINATE
P.T. 1428+27.2	2649891.340	607653.826
P.C. 1453+21.0	2652032.998	608931.062
P.T. 1480+70.5	2653422.753	611496.012
P.C. 1505+59.2	2653604.765	613664.123
P.T. 1539+10.0	2655193.784	616492.767

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Site Copy

Pupo - Property
BT 1
(Port Arrow)

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT. CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

OCT 2 0 2004

Operations Division
Western Evaluation Section

SUBJECT: MVN-1998-3311-WY

Lake Charles Harbor & Terminal District
Post Office Box 3753
Lake Charles, Louisiana 70602

Gentlemen:

As requested in your letter dated October 1, 2004, the authorization granted by the Secretary of the Army in a permit dated January 24, 2000, from the District Engineer at New Orleans, Louisiana, to complete clearing, grading, and placing fill material as necessary to construct an industrial bulk handling facility with associated roadways, utilities and drainage improvements, in Lake Charles, Louisiana, in Calcasieu Parish, is specifically extended to October 31, 2007.

The conditions, to which the work is made subject, excepting the time limit for completion, remain in full force and effect.

A copy of this signed letter, including the attached drawings, must be conspicuously displayed at the project site, until the proposed work is completed.

This is the last extension of time that will be granted for this permit without full permit reprocessing. If the work is not completed by the date granted under this letter, it will be necessary for you to reapply for a permit to perform any work after that date. You then must submit a new completed application form, permit drawings indicating work completed and remaining, and request new letters of no objection. It is possible that, as a result of the new evaluation, your request for a time extension could be denied or the authorization for the portion of your project not completed could be significantly modified.

BY AUTHORITY OF THE SECRETARY OF THE ARMY:

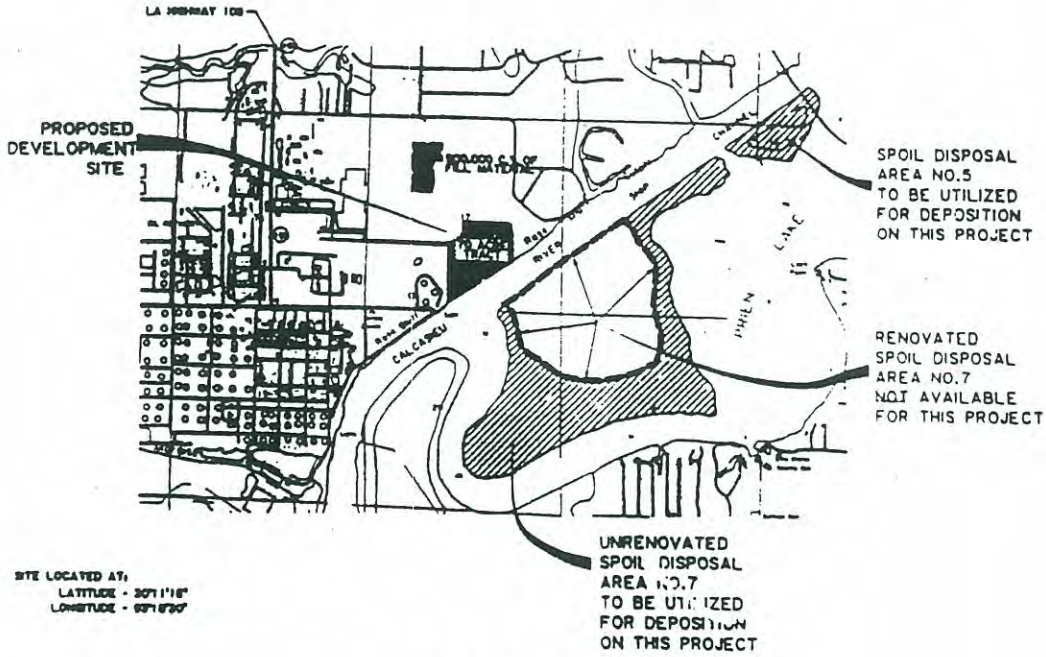
Ronald J. Ventola

Ronald J. Ventola
Chief, Regulatory Branch
for
Peter J. Rowan
Colonel, U.S. Army
District Engineer

Enclosures



LOUISIANA VICINITY MAP
NOT TO SCALE



LAKE CHARLES VICINITY MAP
SCALE: 1" = 4000'

PURPOSE: TO FILL LOW AREAS ACROSS PORT OF LAKE CHARLES PROPERTY.

ADJACENT PROPERTY OWNERS
SEE ATTACHED SHEET FOR LISTING

VICINITY MAP

SCALE AS NOTED

KEYSER & ASSOCIATES, INC
CONSULTING ENGINEERS
600 CITIES SERVICE HWY
SULPHUR, LOUISIANA 70663

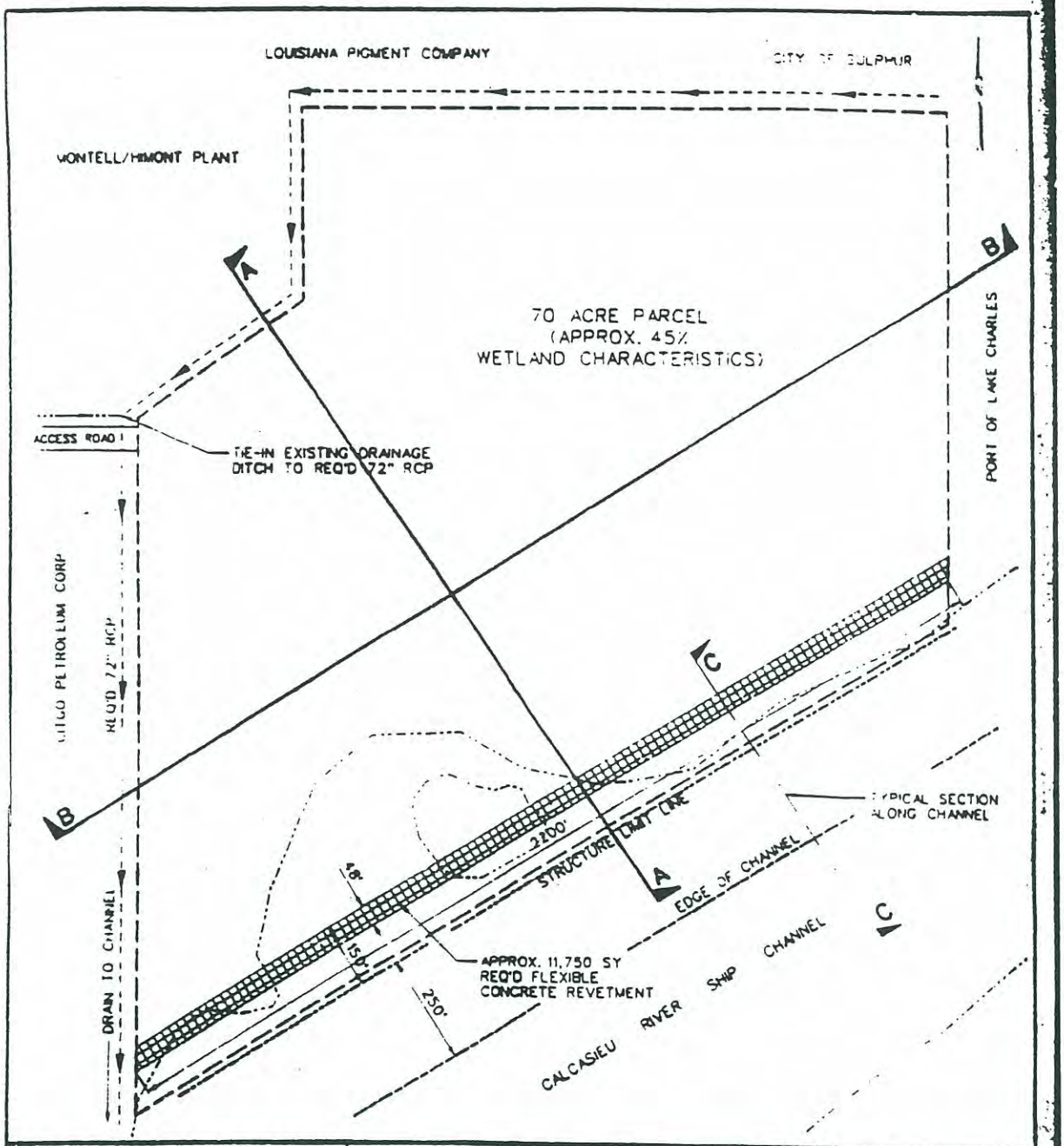
PORT OF LAKE CHARLES
PUJO PROPERTY DEVELOPMENT

IN: LAKE CHARLES
AT: BETWEEN MILE MARKERS 32 & 33 (CALCASIEU RIVER)
PARISH OF: CALCASIEU STATE OF: LOUISIANA

APPLICATION BY: PORT OF LAKE CHARLES

SHEET: 1 of 8

REVISED NOV. 1990
DATE: MAY 1988


LOUISIANA PIGMENT COMPANY
CITY OF SULPHUR
MONTELL/HIMONT PLANT
70 ACRE PARCEL
(APPROX. 45%
WETLAND CHARACTERISTICS)
A
B
C
ACCESS ROAD
TIE-IN EXISTING DRAINAGE DITCH TO REQ'D 72" RCP
PORT OF LAKE CHARLES
CITGO PETROLEUM CORP.
REQ'D 72" RCP
DRAIN TO CHANNEL
TYPICAL SECTION ALONG CHANNEL
2100'
STRUCTURE LIMIT LINE
EDGE OF CHANNEL
450'
150'
250'
APPROX. 11,750 SY
REQ'D FLEXIBLE
CONCRETE REVETMENT
CALCASIEU RIVER SHIP CHANNEL
PURPOSE: TO FILL LOW AREAS ACROSS PORT OF LAKE CHARLES PROPERTY.
ADJACENT PROPERTY OWNERS
SEE ATTACHED SHEET FOR LISTING
SITE PLAN
0 75 150 300 600
SCALE: 1" = 300'
PORT OF LAKE CHARLES
PUJO PROPERTY DEVELOPMENT
OF LAKE CHARLES
AT: BETWEEN MILE MARKERS 32 & 33 (CALCASIEU RIVER)
PARISH OF: CALCASIEU
STATE OF: LOUISIANA
APPLICATION BY: PORT OF LAKE CHARLES
SHEET: 2 of 6
DATE: MAY 1998

Lake Charles
Harbor
& Terminal
District

Post Office Box 3753
Lake Charles, LA 70602
Phone 337-439-3661
Facsimile 337-493-3523

October 1, 2004

Mr. Ronald J. Ventola
Chief, Regulatory Branch
Department of the Army
New Orleans District, Corp of Engineers
P.O. Box 60267
New Orleans, LA 70160

Re: Permit WI-19-908-3311

Dear Mr. Ventola:
This letter is written to request an extension to permit WI-19-980-3311 in accordance with the general conditions of the permit. The planned improvements to this site south of our Bulk Terminal 1 have not been ~~started~~ completed due to funding limitations. It is anticipated that these improvements will be completed within the next four years as part of continued port development.

If you have any questions please contact me at (337) 493-3526. Thank you for your assistance.

Sincerely,

Jimmy D McGinnis, P.E.
Director of Engineering, Maintenance, & Development

CC:
Linda Manuel
Mike Dees, General Counsel
File

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

JAN 24 2000

FEB 2000
RECEIVED
PORT OF
LAKE CHARLES

Operations Division
Western Evaluation Section

SUBJECT: WI-19-980-3311

Lake Charles Harbor and
Terminal District
Post Office Box 3753
Lake Charles, Louisiana 70602

Gentlemen:

Enclosed is a permit dated this date, subject as above, authorizing work under the Department of the Army permit program.

You are again reminded that any work not in accordance with the plans is subject to removal regardless of the expense and the inconvenience that such removal may involve and regardless of the date when the discrepancy is discovered.

Your attention is directed to all the terms and conditions of the approval, especially those conditions relative to supervision and approval of work by the District Engineer. In order to have the work finally approved and declared legal, all terms and conditions of the permit and plans shown on the drawings attached thereto, must be rigidly adhered to.

It is necessary that you notify the District Engineer, Attention: Regulatory Branch, Western Evaluation Section, in writing, prior to commencement of work and also upon its completion. The notification must include the permittee's name, as shown on the permit, and the permit number. Please note the expiration date on the permit. Should the project not be completed by that date, you may request a permit time extension. Such requests must be received before, but no sooner than, six months before the permit expiration date and must show the work completed and the reason the project was not finished within the time period granted by the permit.

The enclosed Notice of Authorization, ENG Form 4336, is to be conspicuously displayed at the site of work.

Sincerely,

Ronald J. Ventola

Ronald J. Ventola
Chief, Regulatory Branch

Enclosure

RECEIPT FOR COLLECTION OF PERMIT FEES

DATE: 1/20/00

RECEIVED FROM: Lake Charles Harbor & Terminal District

THE SUM OF $ One Hundred and no/100

($ 100.00) FOR THE FOLLOWING.

WI-19-980-3311

EK# 034459

TITLE OF RECEIVING AGENT

AC

SIGNATURE OF AGENT

Kathryn Matranga

RESOLUTION NO. 2000-008

A RESOLUTION approving agreement with Stream Wetland Services, L.L.C. for mitigation of 26.2 acres of the 70-acre tract of District property between Bulk Terminal No. 1 and Citgo.

WHEREAS, the District acquired a permit from the Corps of Engineers for the 70-acre tract of District property between Bulk Terminal No. 1 and Citgo that was purchased from the Pujo Heirs; and

WHEREAS, the permit requires wetland mitigation of the property; and

WHEREAS, Stream Wetland Services, L.L.C. was named in the permit as the agency the District has a contract with; and

WHEREAS, Stream Wetland Services, L.L.C. has requested payment in the amount of $95,660.000 for mitigation of 26.2 acres of the 70-acre tract of District property.

NOW THEREFORE, BE IT RESOLVED BY THE BOARD OF COMMISSIONERS OF THE LAKE CHARLES HARBOR AND TERMINAL DISTRICT IN REGULAR SESSION CONVENED THAT:

SECTION 1: All of the foregoing introductory provisions are hereby made a part of this Resolution and the Board of Commissioners of the Lake Charles Harbor and Terminal District does hereby approve the agreement with Stream Wetland Services, L.L.C. for mitigation of 26.2 acres of the 70-acre tract of District property between Bulk Terminal No. 1 and Citgo at a

cost of $95,600.00, and authorize the Executive Director, Glenwood W. Wiseman, to execute any necessary documents therewith.

THUS PASSED AND ADOPTED AT Lake Charles, Louisiana, on this 14th day of February, 2000.

HILLERY J. LANGLEY, JR., President

I HEREBY CERTIFY that the above and foregoing is a true and correct copy of a resolution adopted by the Board of Commissioners of the Lake Charles Harbor and Terminal District in regular session convened on this 14th day of February, 2000.

JAMES C. WATTS, Secretary

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF:

JAN 26 2012

Operations Division
Western Evaluation Section

SUBJECT: MVN 1998-03311 WY

Lake Charles Harbor & Terminal District
Post Office Box 3753
Lake Charles, Louisiana 70602

Gentlemen:

Revised drawings attached in three sheets, furnished with your application dated December 15, 2011, indicating a modification to change the bulkhead material from standard sheet pile with tie backs, to an open cell design, located at the Lake Charles Cogeneration Plant on the right descending bank of the Calcasieu River Ship Channel, Calcasieu Parish, are approved and will be included in your plans for the work authorized by the Secretary of the Army in a permit dated August 18, 2008.

The conditions to which the work is made subject, remain in full force and effect.

A copy of the first page of this permit approval letter must be conspicuously displayed at the project site. Also, you must keep a copy of this signed letter, with enclosed drawings, at the project site until the work is completed.

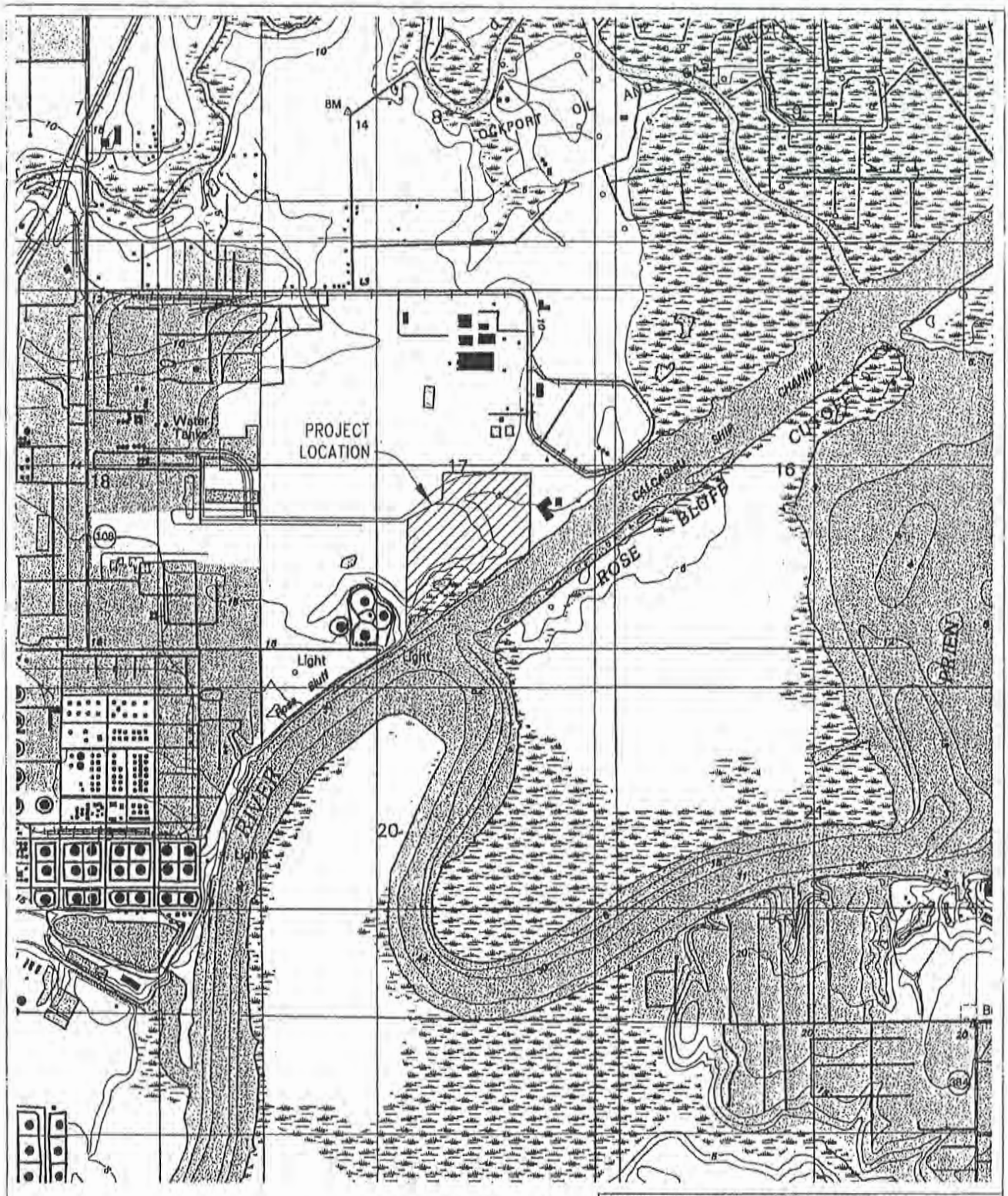
The time limit for completion of this work is August 30, 2013.

The New Orleans District Regulatory Branch is committed to providing quality and timely service to our customers. In an effort to improve customer service, please take a moment to complete and return the attached Customer Service Survey or go to the survey found on our web site at http://per2.nwp.usace.army.mil/survey.html.

BY AUTHORITY OF THE SECRETARY OF THE ARMY:

Pete J. Serio
Chief, Regulatory Branch
for
Edward R. Fleming
Colonel, US Army
District Commander

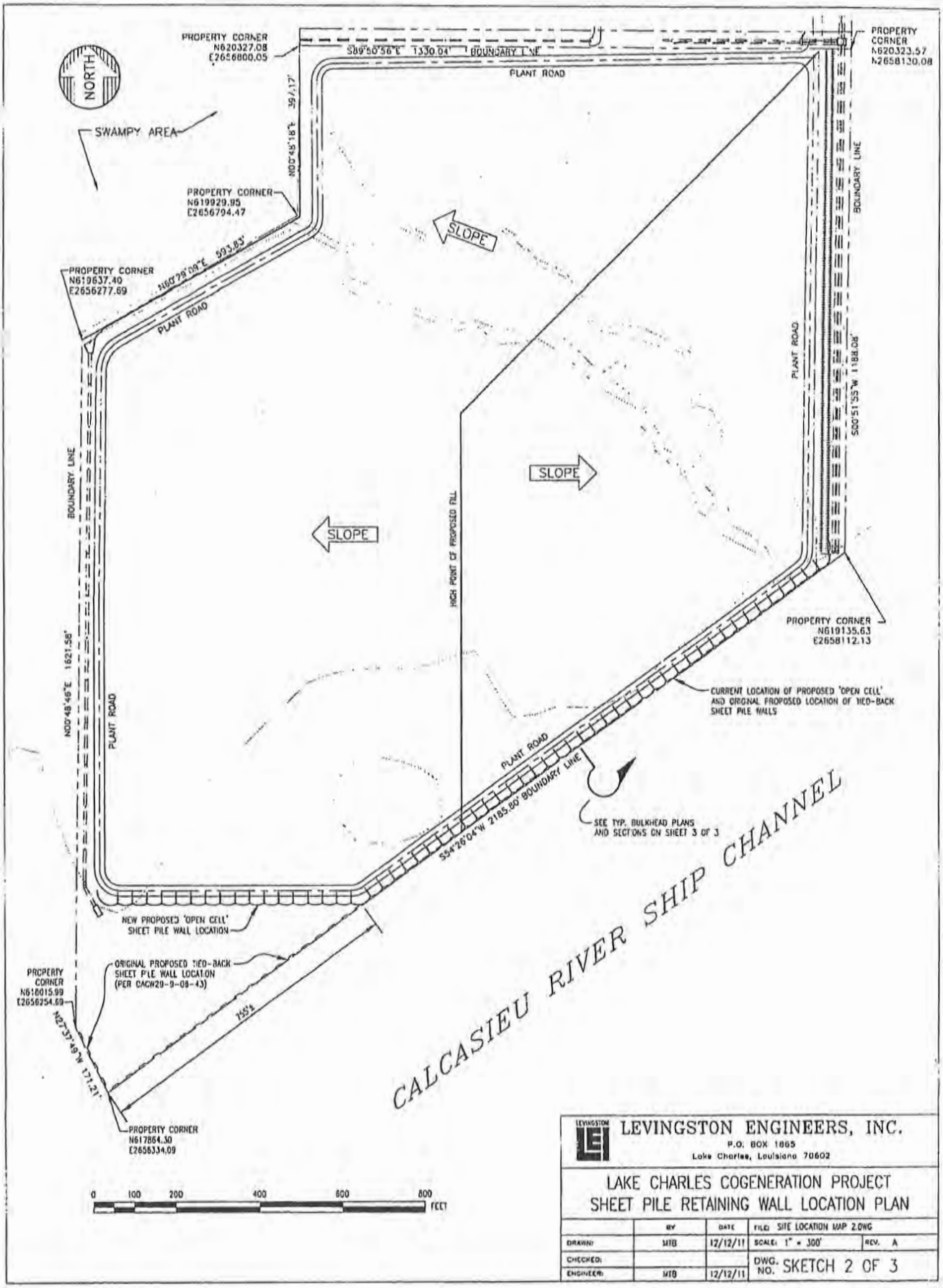
Enclosures



LEVINGSTON ENGINEERS, INC.
P.O. BOX 1865
Lake Charles, Louisiana 70602

LAKE CHARLES COGENERATION PROJECT
PERMIT APPLICATION VICINITY MAP

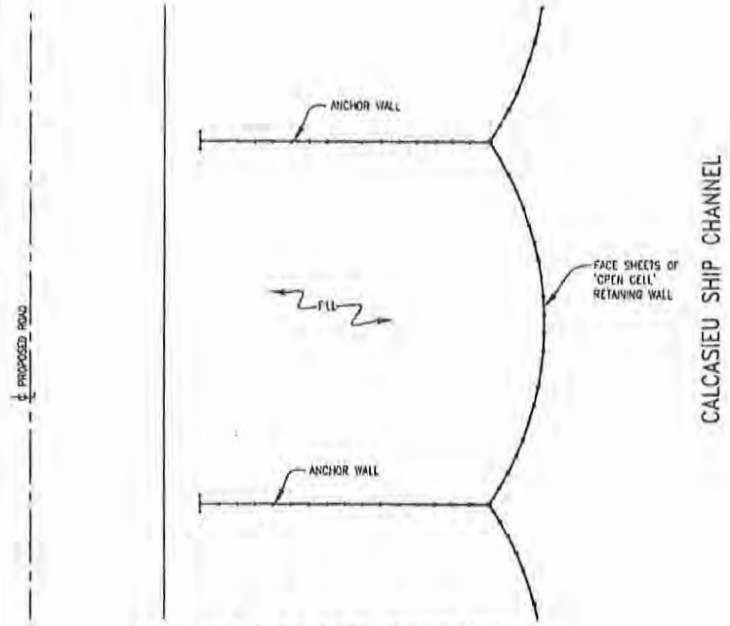
	BY	DATE	FILE: SITE LOCATION MAP 1.DWG	
DRAWN:	MTB	12/12/11	SCALE: 1" = 2000'	REV: A
CHECKED:			DWG. NO. SKETCH 1 OF 3	
ENGINEER:	MTB	12/12/11		



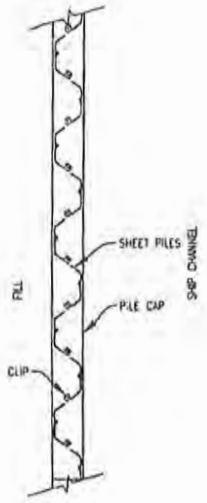
LEVINGSTON ENGINEERS, INC.
P.O. BOX 1865
Lake Charles, Louisiana 70602

LAKE CHARLES COGENERATION PROJECT
SHEET PILE RETAINING WALL LOCATION PLAN

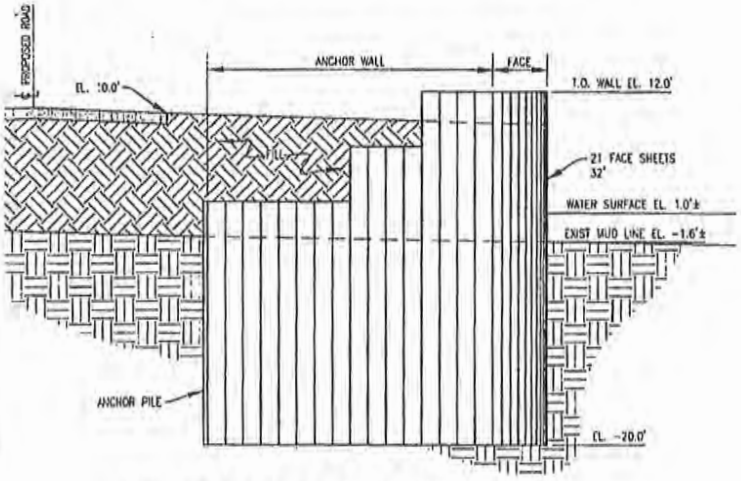
	BY	DATE	FILE: SITE LOCATION MAP 2.DWG	
DRAWN:	MTB	12/12/11	SCALE: 1" = 300'	REV. A
CHECKED:			DWG. NO. SKETCH 2 OF 3	
ENGINEER:	MTB	12/12/11		



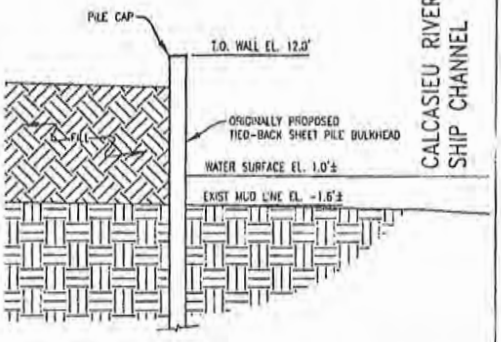
TYP. PLAN AT NEW PROPOSED
'OPEN CELL' SHEET PILE BULKHEAD
1" = 1/16"



TYP. PLAN AT ORIGINALLY PROPOSED
TIED-BACK SHEET PILE BULKHEAD
1" = 1/8"



TYP. SECTION AT NEW PROPOSED
'OPEN CELL' SHEET PILE BULKHEAD
1" = 1/16"



TYP. SECTION AT ORIGINALLY PROPOSED
TIED-BACK SHEET PILE BULKHEAD
1" = 1/16"

NOTES:

1. THE ORIGINALLY PROPOSED TIED-BACK SHEET PILE BULKHEAD WAS DETERMINED TO BE IMPRACTICAL AND THE 'OPEN CELL' ARRANGEMENT IS BEING PROPOSED IN IT'S PLACE.
2. THE NUMBER, LENGTH, AND DEPTH OF SHEETS SHOWN ON THE 'OPEN CELL' ARRANGEMENT WILL VARY ALONG THE LENGTH OF THE WALL AS THE SOIL PROFILE AND GRADES CHANGE.

LEVINGSTON ENGINEERS, INC.
P.O. BOX 1865
Lake Charles, Louisiana 70602

LAKE CHARLES COGENERATION PROJECT
TYP. SHEET PILE PLAN AND SECTIONS

	BY	DATE	FILE: TYP PLAN AND SECTIONS 3.DWG	
DRAWN:	MTB	12/12/11	SCALE: AS SHOWN	REV. A
CHECKED:			DWG. NO. SKETCH 3 OF 3	
ENGINEER:	MTB	12/12/11		

APPENDIX C

USFWS CONSULTATIONS

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BOBBY JINDAL
GOVERNOR

State of Louisiana
DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF WILDLIFE

ROBERT J. BARHAM
SECRETARY
JIMMY L. ANTHONY
ASSISTANT SECRETARY

Date	May 28, 2009
Name	Lawrence R. Leib
Company	Lake Charles Cogeneration, LLC
Street Address	1330 Post Oak Boulevard, Suite 1600
City, State, Zip	Houston, TX 77056
Project	
Project ID	5280901
Invoice Number	09052801

Personnel of the Habitat Section of the Coastal & Non-Game Resources Division have reviewed the preliminary data for the captioned project. After careful review of our database, *no impacts* to rare, threatened, or endangered species or critical habitats are anticipated for the proposed technical assistance project. No state or federal parks, wildlife refuges, scenic streams, or wildlife management areas are known at the specified site within Louisiana's boundaries.

The Louisiana Natural Heritage Program (LNHP) has compiled data on rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features throughout the state of Louisiana. Heritage reports summarize the existing information known at the time of the request regarding the location in question. The quantity and quality of data collected by the LNHP are dependent on the research and observations of many individuals. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Louisiana have not been surveyed. This report does not address the occurrence of wetlands at the site in question. Heritage reports should not be considered final statements on the biological elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. LNHP requires that this office be acknowledged in all reports as the source of all data provided here. If at any time Heritage tracked species are encountered within the project area, please contact the LNHP Data Manager at 225-765-2643. If you have any questions, or need additional information, please call 225-765-2357.

Sincerely,

for Gary Lester, Coordinator
Natural Heritage Program

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NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA

U.S. DEPARTMENT OF ENERGY

September 28, 2012

Joshua Marceaux
Endangered Species Coordinator
Louisiana Ecological Services Field Office
U.S. Fish and Wildlife Service Southeast Region 4
646 Cajundome Boulevard, Suite 400
Lafayette, Louisiana 70506-4290

SUBJECT: Initiation of Agency Coordination Under the Endangered Species Act for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project in Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Mr. Marceaux:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia), and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). The DOE is preparing an Environmental Impact Statement (EIS) for the proposed Project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 7 of the Endangered Species Act (ESA) of 1973 (7 U.S.C. § 136, 16 U.S.C. § 1531 et seq.). As part of compliance with Section 7 of the ESA, the DOE is also consulting with the Louisiana Department of Wildlife and Fisheries on the proposed project.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings Oil Field south of Houston, in Brazoria County, Texas. Please note that as of June 1, 2012, the name of Lake Charles Cogeneration, LLC was changed to Lake Charles Clean Energy, LLC. Historical references to Lake Charles Cogeneration (LCC) Gasification are now LCCE Gasification.

During the DOE demonstration phase of the proposed project, approximately 4 million tons per year of CO_2 would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project and transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings Oil Field in Brazoria County, Texas during the demonstration period.

626 Cochrans Mill Road, P.O. Box 10940, Pittsburgh, PA 15236
pierna.fayish@netl.doe.gov • Voice (412) 386-5428 • Fax (412) 386-4775 • www.netl.doe.gov

As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the Lake Charles CCS Project and its associated CO_2 capture and compression facilities in Calcasieu Parish, Louisiana;
- the Lake Charles CCS Project proposed 11.1 mile CO_2 pipeline in Calcasieu Parish Louisiana;
- the Lake Charles CCS Project proposed Research Monitoring, Verification, Analysis program for the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation in Brazoria County, Texas; and
- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (connected action).

The area of interest consists of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCCE Gasification (being evaluated as a connected action), which are located in Calcasieu Parish, Louisiana and in Brazoria County, Texas. The area of interest in Calcasieu Parish, Louisiana shown in Enclosure 2 includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, located entirely within the AGR and compression facilities site also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area (see Enclosure 2).
- the proposed new 11.1-mile long CO_2 pipeline transporting CO_2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest.

The project area in Texas includes the location of the proposed CO_2 sequestration in an ongoing commercial enhanced oil recovery operation at the existing Hastings Oil Field in Brazoria County, Texas. The proposed Research MVA program at the existing Hastings Oil Field will not result in any new project-related facilities.

Natural resources investigations have been conducted previously within portions of the project area in Calcasieu Parish, Louisiana, including: investigations by the Port of Lake Charles and permitting for 70-acre property that contains the locations of the Lake Charles CCS Project and LCCE Gasification; and investigations by Denbury Onshore, LLC of the proposed new 11.1-mile long CO_2 pipeline transporting CO_2 to the existing Green Pipeline, including extra workspace and access roads. These investigations included wetland delineation to support US Army Corps of Engineer Clean Water Act Section 404 permitting of the 70-acre property.

Natural resources investigations conducted for the proposed new 11.1-mile long CO_2 pipeline consisted of site investigations. A desktop review was performed of the site conditions for all the other project components. DOE is not aware of any other previously conducted natural resources investigations in other portions of the project area in Calcasieu Parish, Louisiana. DOE has determined from these investigations that no threatened or endangered species, nor habitat conditions that could support them, are located within the project area or a 0.5-mile radius around the project area in Calcasieu Parish.

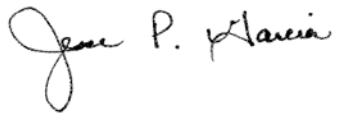
In accordance with Section 7 of the ESA, DOE is writing to seek your input and confirmation that no threatened or endangered species are within the project area in Calcasieu Parish, Louisiana and would therefore, not be impacted by the proposed project. DOE is also seeking your comments on any issues or concerns for wildlife resources such as significant/critical habitats that might be affected by the proposed Project. DOE has not conducted separate consultation with the Texas Parks and Wildlife Department on the proposed new facilities in Brazoria County, Texas since the proposed project components are within an existing, operating oil field. Based on publicly available information, no species of concern nor significant or critical habitat is present.

DOE looks forward to receiving your comments on any issues or concerns for wildlife and significant/critical habitat resources that might be affected by the proposed project. Please forward the results of your review and any requests for additional information to our contractor:

Janine Whitken
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, New York 14086

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

cc: Amity Bass, Louisiana Department of Wildlife and Fisheries

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. Area of Interest for proposed Lake Charles CCS Project and LCCE Gasification facilities in Calcasieu Parish, Louisiana

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Enclosure 1

Location of the Proposed Lake Charles Carbon Capture and Sequestration Project and LCCE Gasification Project

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Lake Charles CCS Project Carbon Dioxide (CO_2) Capture and Sequestration (CCS)

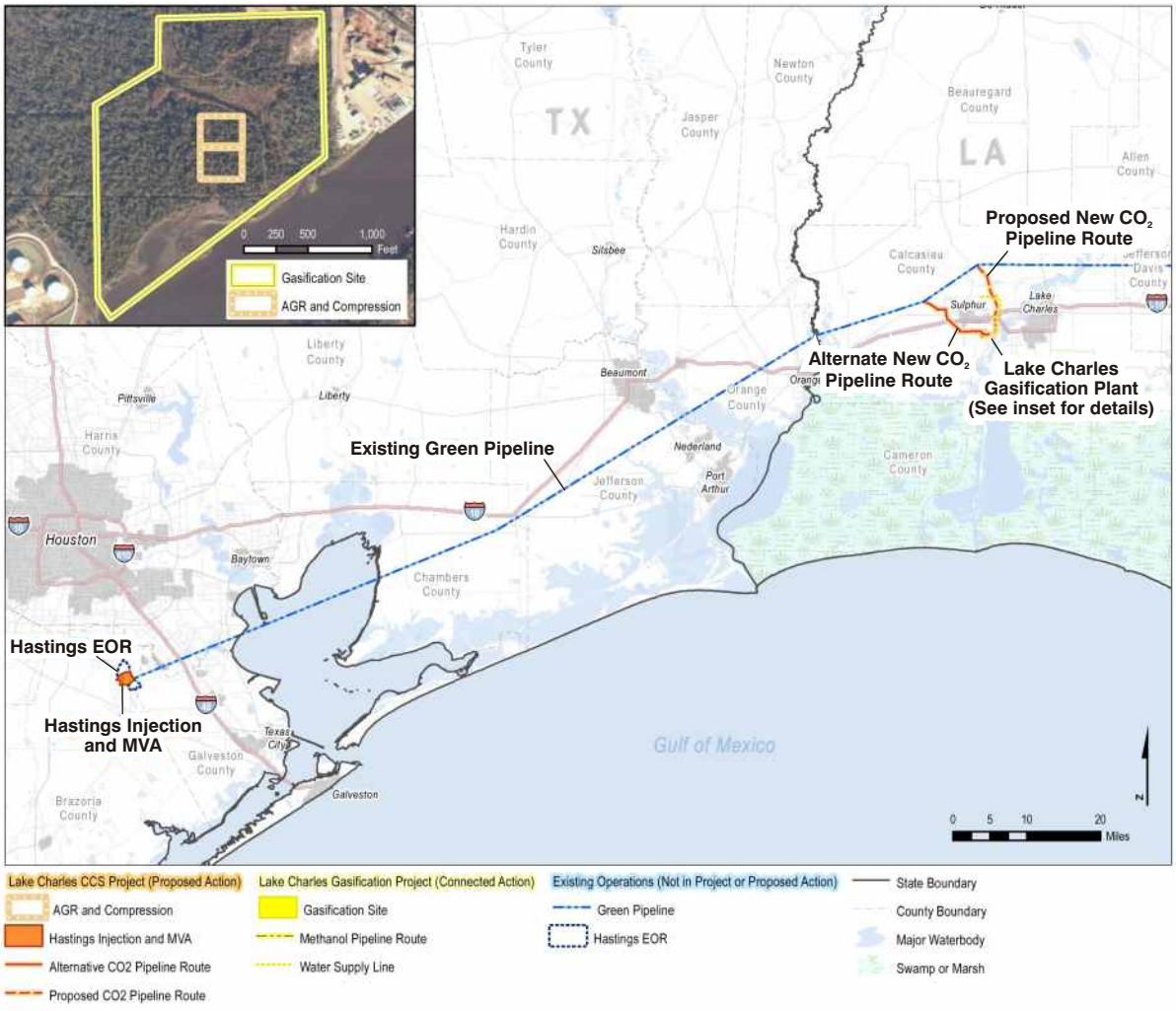
The **Lake Charles CCS Project** will capture and separate CO_2 from the process gas associated with the gasification process at the Lake Charles Cogeneration Gasification Plant (LCC Gasification Project), considered a connected action. The LCC Gasification Project will use **petroleum coke ("pet coke")**, a lower value oil refinery by-product, to produce methanol. Approximately 4 million tons per year of CO_2 would be compressed and delivered via a new connecting pipeline to the existing Green Pipeline for transport and use in existing Enhanced Oil Recovery (EOR) operations along the Gulf Coast, including a portion of the Hastings oil field, south of Houston, Texas.

CCS Technology

The Lake Charles CCS Project includes the incorporation of the CCS technology at the LCC Gasification plant, which would capture and compress the produced CO_2. As part of the project, the following facilities and other ancillary facilities would be incorporated:

- **CO_2 capture facility** – CO_2 is separated from the gasification process gas.
- **CO_2 compression facilities** – CO_2 is compressed, monitored, and transported to the pipeline.

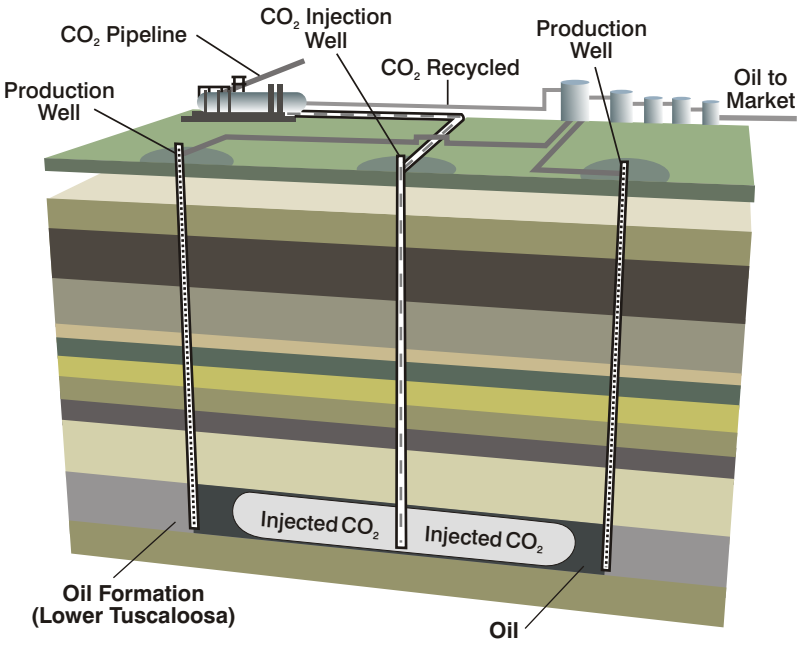
Compressed CO_2 would be transported to a storage site along a new CO_2 pipeline, which will parallel existing rights-of-ways (ROWs), such as roadways, pipelines, railroads, and transmission lines to the extent practicable.

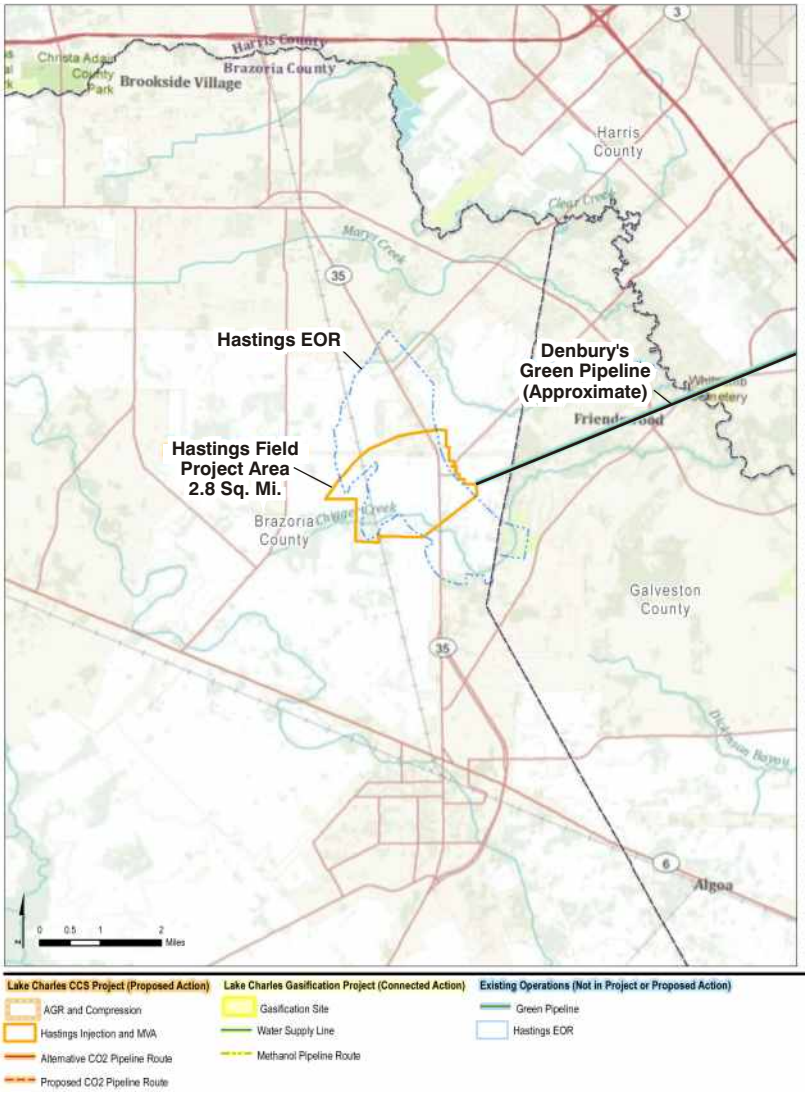


CO_2 Sequestration Process

CO_2 Sequestration is the process by which CO_2 is injected into suitable geologic formation and permanently stored. The Lake Charles CCS Project will use existing **Enhanced Oil Recovery (EOR)** operations to store the captured CO_2.

EOR is the process by which compressed CO_2 is used to increase the amount of crude oil that is extracted from an oil reservoir. CO_2 is injected into the reservoir which displaces the oil, allowing more oil to be extracted than compared to standard methods. After EOR operations are concluded, the CO_2 injected in the EOR reservoir is ultimately permanently stored within the reservoir.





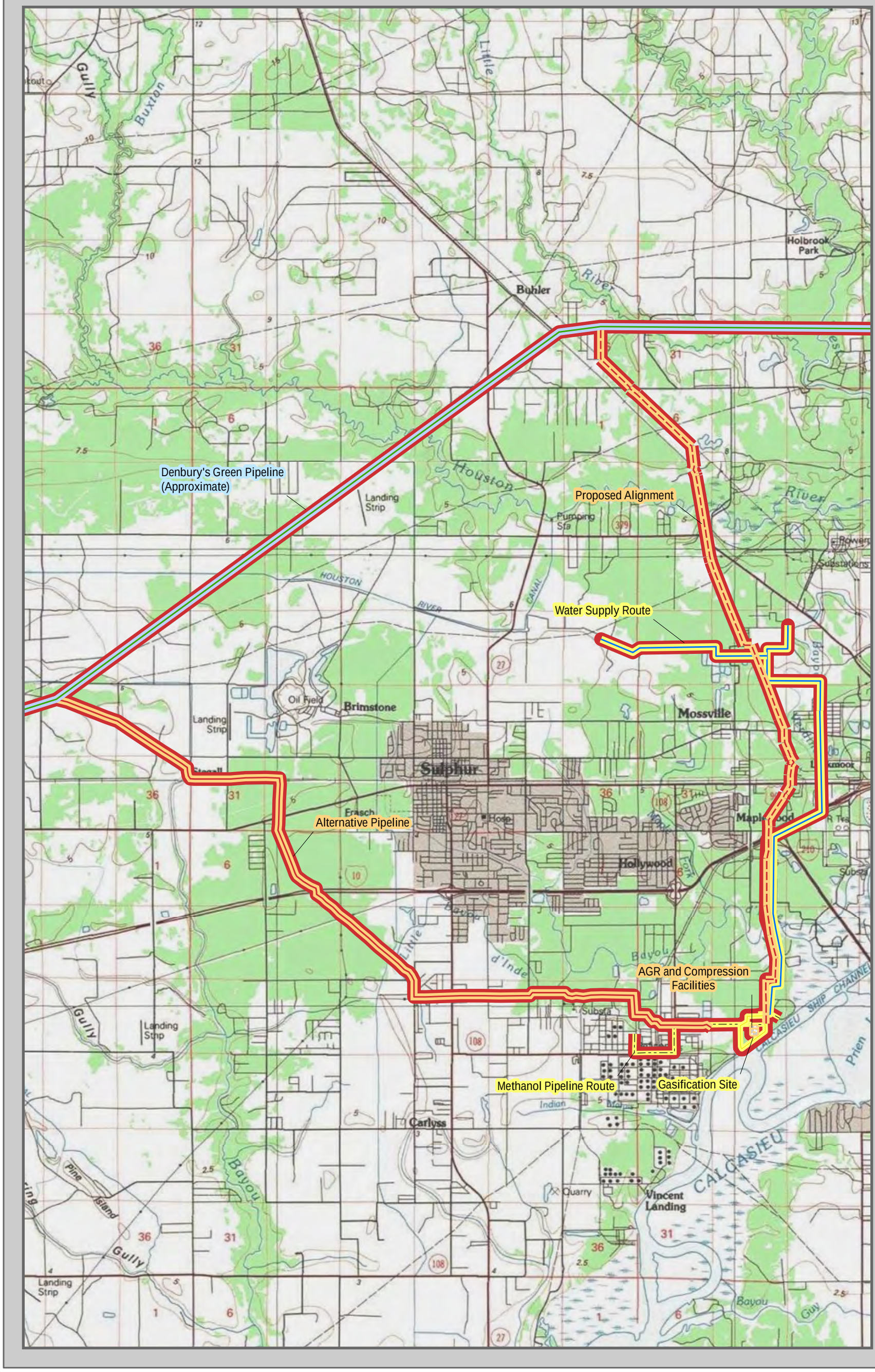
DOE's demonstration phase of the Lake Charles CCS Project includes a comprehensive **research monitoring, verification, and accounting (MVA)** program that would be implemented over a portion of the existing CO_2 EOR operations at Hastings oil field, Texas. The MVA program will assess the safety and effectiveness of long-term geologic storage of CO_2, by demonstrating the permanent storage of approximately 1 million tons per year of the injected CO_2.

Enclosure 2

Proposed Lake Charles Carbon Capture and Sequestration Project and LCCE Gasification Project Facilities in Calcasieu Parish, Louisiana

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Path: M:\Houston\Lake_Charles_Leucadia\Maps\MXDs\DEIS\2011_Oct04\LA APE Overview Map.mxd



N

0 0.5 1 2 Miles

Source: USGS 1:24,000 Friendswood (1998); Pearland (1983); Manval (1977); and Algoa (1977) Quadrangles.

- Area of Potential Effect (APE)
- Lake Charles CCS Project (Proposed Action)
- AGR and Compression
- Alternative CO2 Pipeline Route
- Proposed CO2 Pipeline Route
- Lake Charles Gasification Project (Connected Action)
- Gasification Site
- Water Supply Line
- Methanol Pipeline Route
- Existing Operations (Not in Project or Proposed Action)
- Green Pipeline

Figure 1
Overview of the APE
(Area of Potential Effect) for the
Proposed Facilities within
Calcasieu Parish, Louisiana

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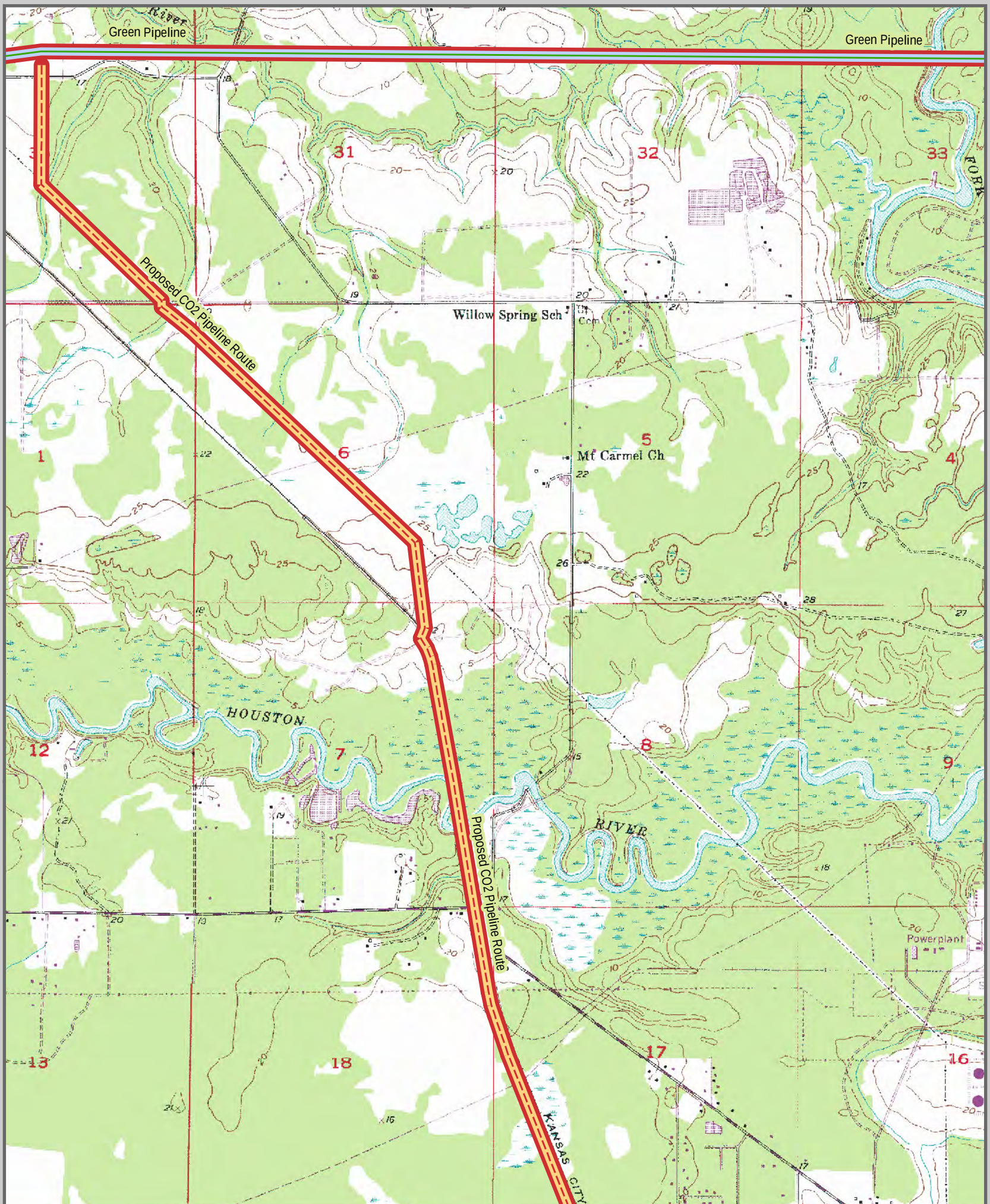
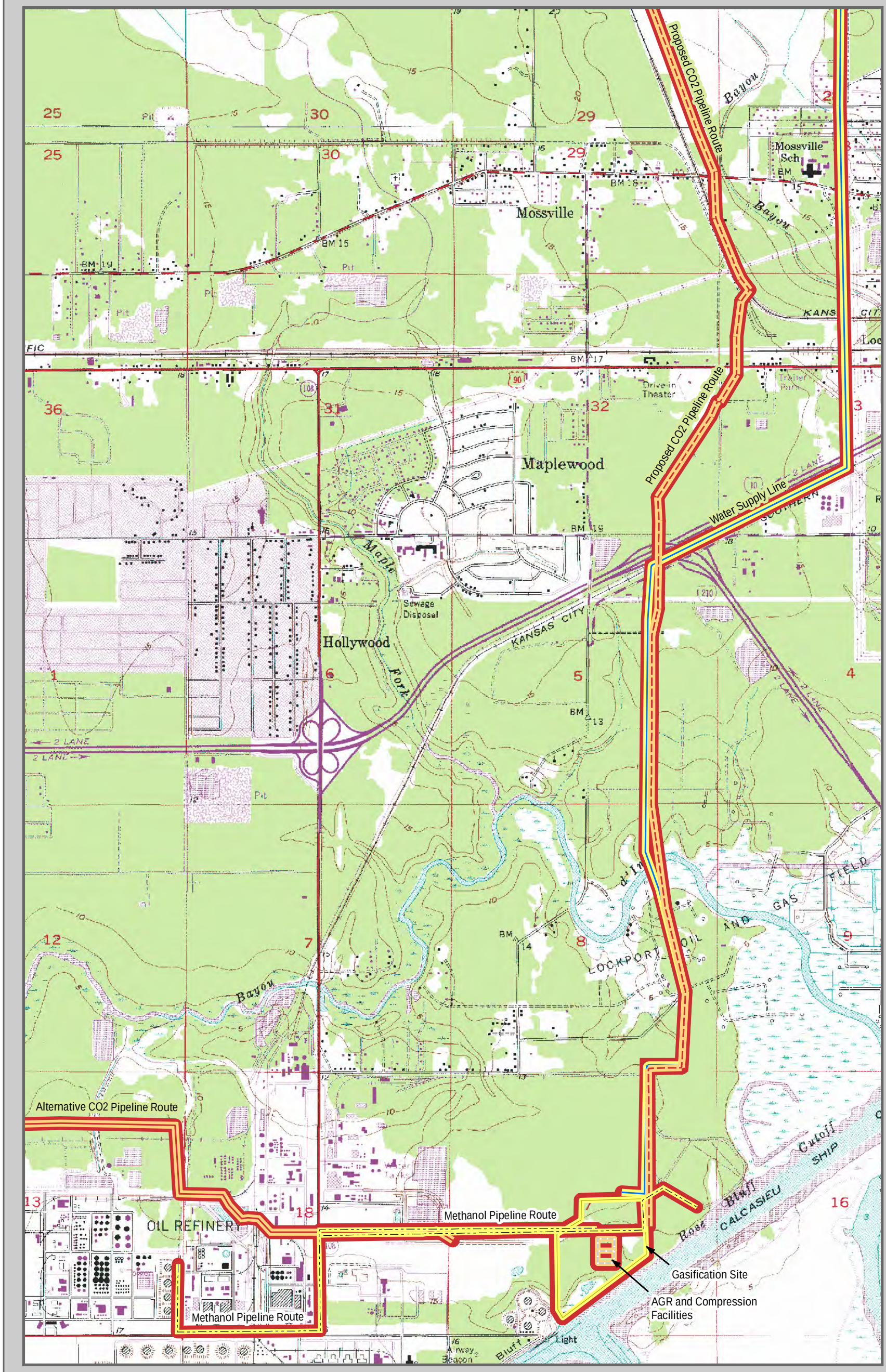


Figure 1-1
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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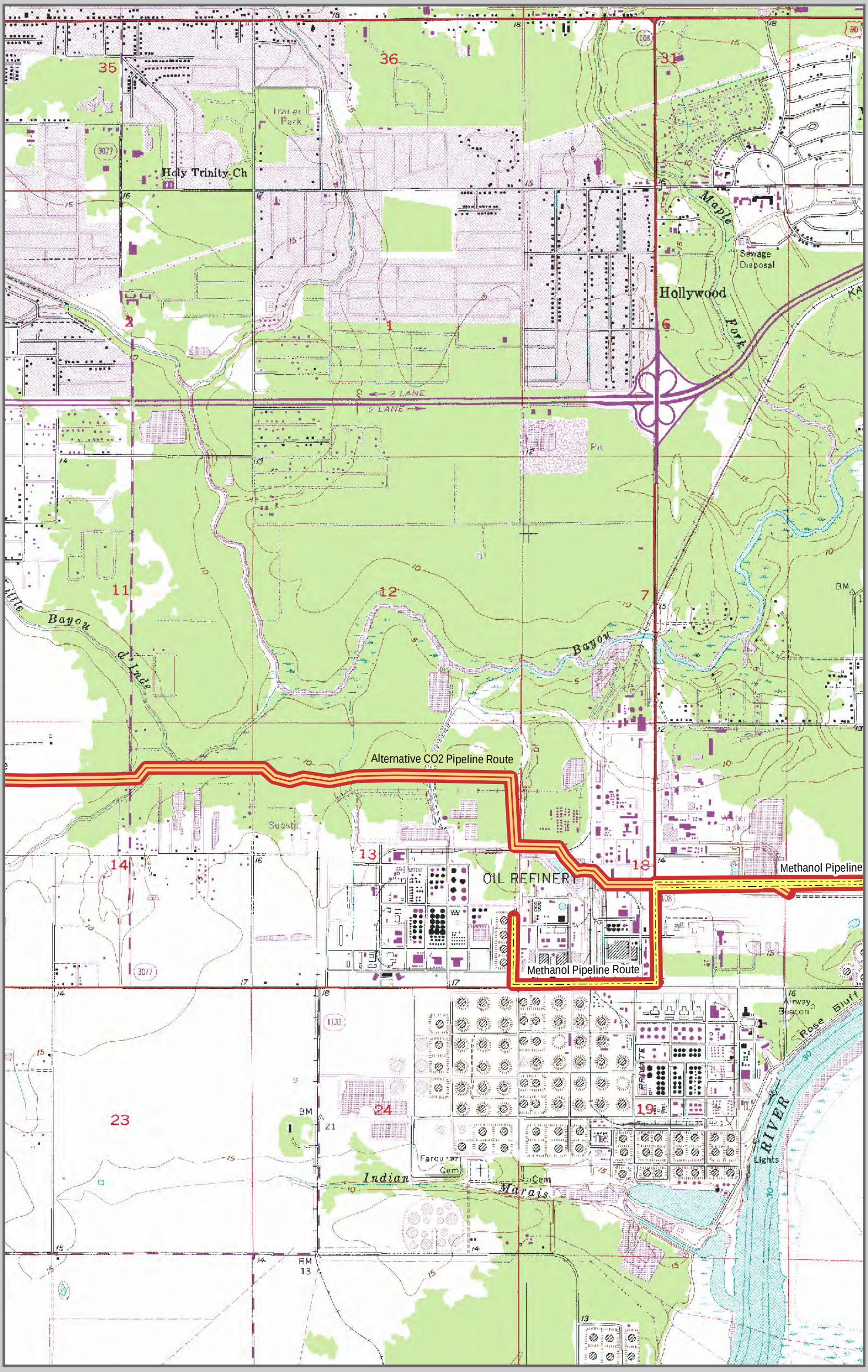
Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

- Area of Potential Effect (APE)
- Lake Charles CCS Project (Proposed Action)
  - AGR and Compression
  - Alternative CO2 Pipeline Route
  - Proposed CO2 Pipeline Route
- Lake Charles Gasification Project (Connected Action)
  - Gasification Site
  - Methanol Pipeline Route
  - Water Supply Line
- Existing Operations (Not in Project or Proposed Action)
  - Green Pipeline

Figure 1-2
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Figure 1-3
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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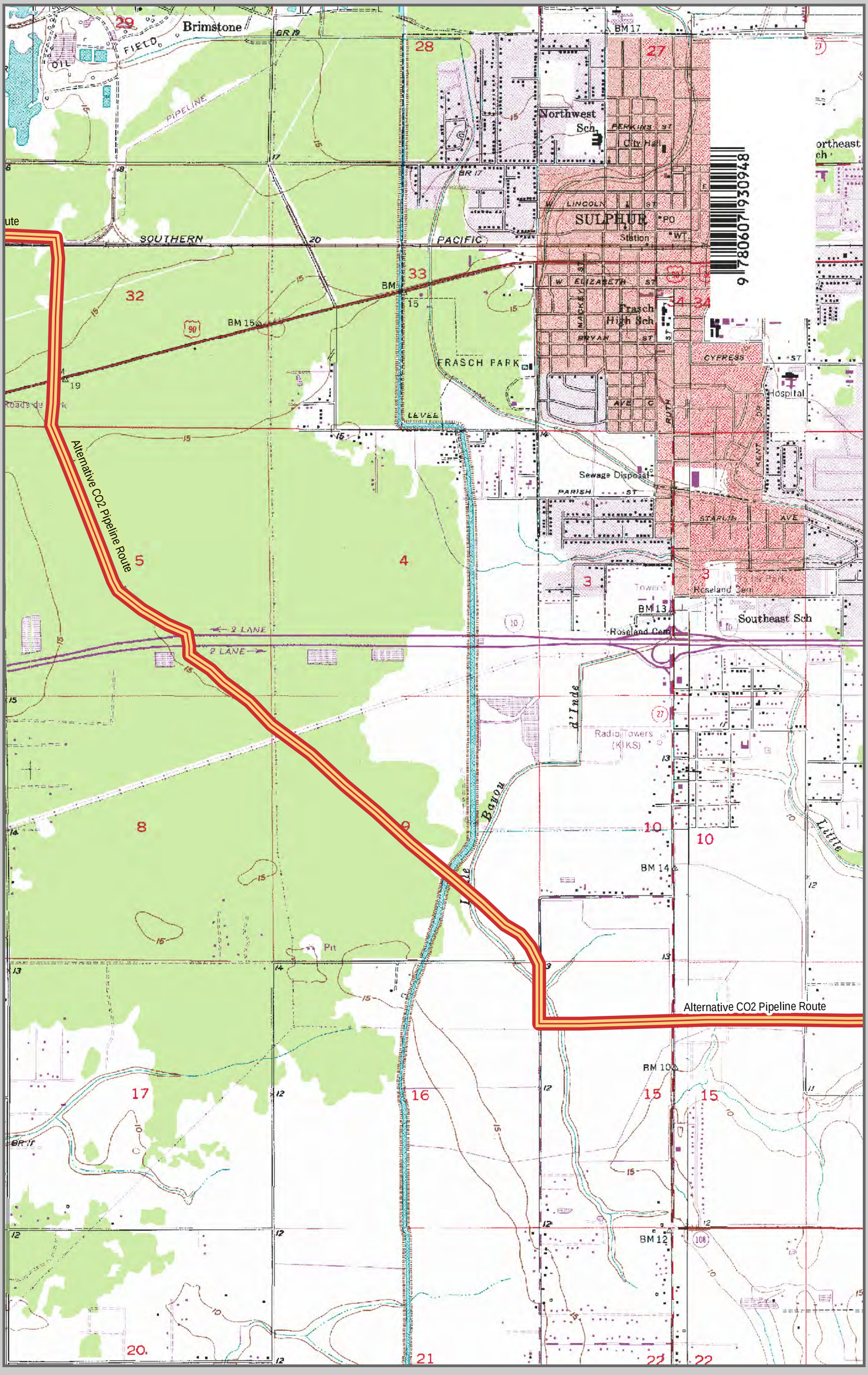
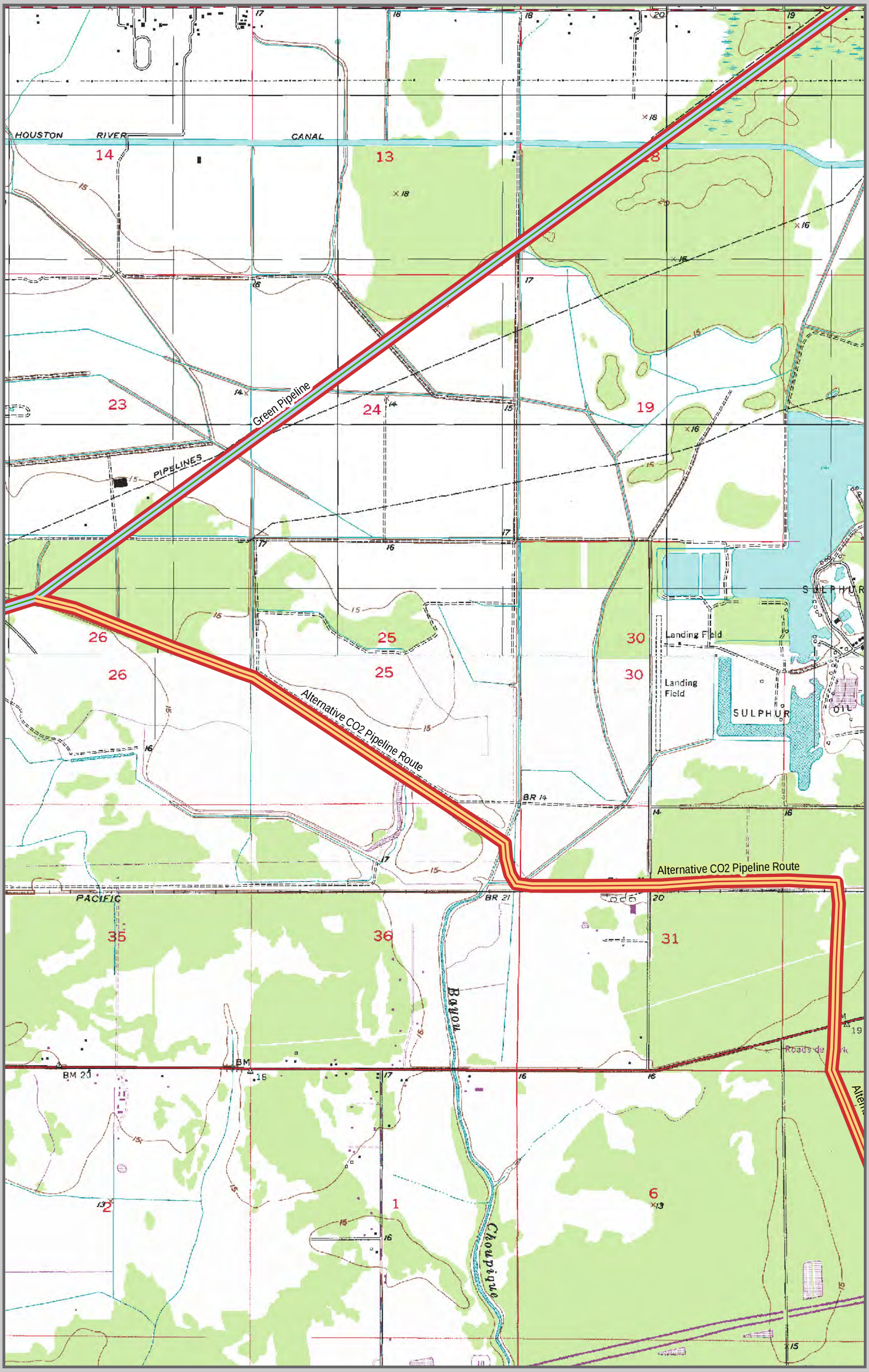
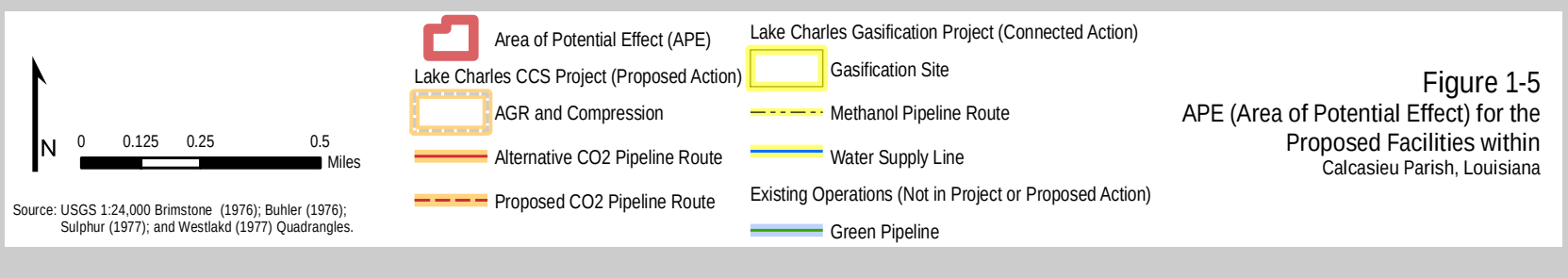


Figure 1-4
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Figure 1-5
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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Joshua Marceaux

From:	Hassan, Komi
Sent:	Monday, March 18, 2013 4:15 PM
To:	joshua_Marceaux@fws.gov; Whitken, Janine
Cc:	Collins, Georganna B.
Subject:	Agency Coordination Under the Endangered Species Act for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project in Calcasieu Parish, Louisiana (and Brazoria
Attachments:	Figure 2.3-1 GasificationSite_Details.pdf; Natural Resource Investigations Summary Table.pdf; LCCE Project Shapefiles_031813.zip

Dear Joshua,

In response to your request for additional information from the Initiation of Agency Coordination Letter that was submitted by DOE NETL on September 28, 2012, please find attached the shapefiles for the permitted Lake Charles Clean Energy (LCCE) Gasification Plant and the proposed raw water and hydrogen pipelines associated with the LCCE project. A summary table describing the project components and status of associated natural resource investigations is also attached to this email.

The exact location of the methanol and sulfuric acid material storage area has not been selected. The area would be located a short distance from the LCCE Gasification Plant site at the Port of Lake Charles. Leucadia is in the process of identifying a parcel of up to 40 acres required for storage. Leucadia would use siting criteria described below to select the site for the proposed storage area within 1 mile of the gasification plant to minimize the pipeline routes to and from the storage area. The siting criteria include:

- Land ownership (public, private);
- Consistency with current land use;
- Proximity of the Port of Lake Charles to the gasification facility's major components;
- Proximity to the gasification facility for off-site components;
- Parcel size;
- Use of existing utility corridors;
- Avoidance of wetlands, streams, and floodplains;
- Minimization of the number of pipeline and linear stream crossings;
- Avoidance of sensitive habitats; and
- Avoidance of cultural resources.

The routes of the natural gas and potable water pipelines and electric transmission line would be within existing maintained ROWs along the access road to the gasification plant site, as shown in Figure 2.3-1.

Please use the center of the LCCE project area shapefile to create the appropriate buffer to perform the listed species clearance review for the methanol and sulfuric acid material storage area and pipelines.

Please contact me at 225-773-2276 if you have any questions or require any additional information.

Thanks,

Komi

Komi Hassan
Ecology and Environment, Inc.
11550 Newcastle Ave, Suite 250
Baton Rouge, LA 70791
Phone: 225-773-2276 | Fax: 225-298-5081
khassan@ene.com | www.ene.com



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This project has been reviewed for effects to Federal trust resources under our jurisdiction and currently protected by the Endangered Species Act of 1973 (Act). The project, as proposed,
( ) Will have no effect on those resources
(✓) Is not likely to adversely affect those resources.
This finding fulfills the requirements under Section 7(a)(2) of the Act.

Acting Supervisor — Date
Louisiana Field Office
U.S. Fish and Wildlife Service

SITE MAY CONTAIN WETLANDS
Contact the U.S. Army Corps of Engineers
for a jurisdictional determination.

District: New Orleans, LA

Telephone No. 504-862-2274

From:	philip leonards
To:	Whitken, Janine
Cc:	Taub, Cynthia; Lawrence Leib
Subject:	FW: LNHP Data Request
Date:	Tuesday, October 29, 2013 10:05:49 AM
Attachments:	LNHP_Request.pdf Project_Area.sbn Project_Area.sbx Project_Area.shp Project_Area.shx Project_Area.dbf Project_Area.prj

---

please see below

Philip Leonards, P.E.
Leucadia Energy
1330 Post Oak Blvd. Suite 1600
Houston, Texas 77056
Office - 281-258-2811
Cell - 337-249-5688
pleonards@leucadiaenergy.com

From: Martinez, Jonathan
Sent: Thursday, October 03, 2013 1:12 PM
To: 'nlorenz@wlf.la.gov'
Subject: LNHP Data Request

Nicole

I am requesting the LNHP information for a parcel of land in Lake Charles, Louisiana that is being considered for purchase and development by Lake Charles Gasification. I have included a pdf map showing the project area on a US Topo base as well as a shapfile of the project area. Along with the specific project area could you also include a 1 mile buffer for the data request? Please feel free to call with any questions. My phone number and mailing address are listed below.

Thanks

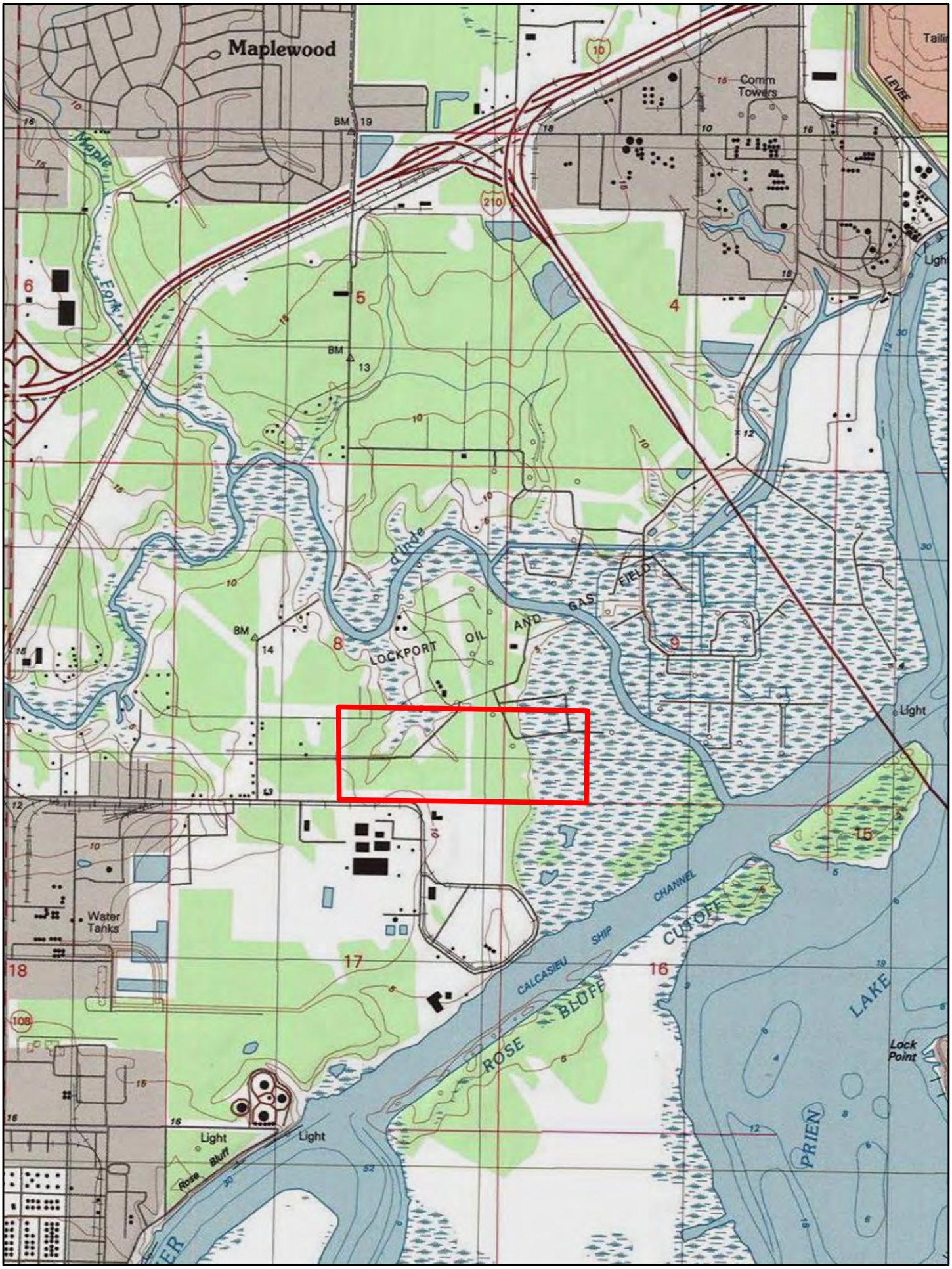
Jonathan Martinez

Environmental Planner
URS Corporation
3500 N. Causeway Blvd., Suite 900
Metairie, Louisiana 70002

Main: 504-837-6326
Direct: 504-218-0856
Fax: 504-831-8860
Email: jonathan.martinez@urs.com

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LEVEE
Maple
Bayou
BM 19
BM 13
BM 14
d'Inde
LOCKPORT
OIL
AND
GAS
FIELD
Water Tanks
Light
Light
Rose Bluff
ROSE
BLUFF
CALCASIEU
SHIP
CHANNEL
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PRIEN
Lock Point
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APPENDIX D

SECTION 106 CONSULTATIONS

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Lake Charles Cogeneration LLC
1330 Post Oak Boulevard
Suite 1600
Houston, TX 77056

September 8, 2008

Ms. Pam Breaux
State Historic Preservation Officer
State of Louisiana
Office of Cultural Development
P.O. Box 94361
Baton Rouge, LA 70802

Re: Air Permit Application: Lake Charles Gasification Facility
Lake Charles Cogeneration, LLC
Lake Charles, Louisiana

Dear Ms. Breaux:

The Lake Charles Cogeneration, LLC (LCC) is preparing an air permit application for the proposed Lake Charles Gasification Facility to be located on property owned by the Port of Lake Charles, in Lake Charles, Louisiana. The LCC property to be developed is adjacent to and west of the existing Port of Lake Charles facilities as shown on the attached.

The LCC requests the following confirmation:

- There are no known archeological sites or historical structures either listed on or eligible for listing on the National Register of Historic Places within 1000 feet of the nearest LCC property boundary.

Should you have any questions, please contact Larry Leib at our office (713) 963-4637 or via e-mail at lrllal@sbcglobal.net. Thank you for your assistance.

Very truly yours,

Donald W. Maley, Jr.
Vice President

cc: Doug Barba
Larry Leib

Enclosures

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MITCHELL J. LANDRIEU
LIEUTENANT GOVERNOR

State of Louisiana
OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT
DIVISION OF ARCHAEOLOGY

PAM BREAUX
SECRETARY

SCOTT HUTCHESON
ASSISTANT SECRETARY

October 28, 2008

Mr. Donald W. Maley, Jr.
Vice President
Lake Charles Cogeneration, LLC
1330 Post Oak Boulevard, Suite 1600
Houston, TX 77056

Re: Air Permit Application: Lake Charles Gasification Facility
Lake Charles Cogeneration, LLC
Calcasieu Parish, Louisiana

Dear Mr. Maley:

This is in response to your letter dated September 8, 2008, concerning the above-referenced project. There is one known archaeological site located with the Port property boundaries, 16CU29, the Citgo Shell Mound; therefore, our office is requesting that a Phase I survey be conducted. I have enclosed a copy of our contracting archaeologists list for your use.

If you have any questions concerning our comments, please do not hesitate to contact Rachel Watson in the Division of Archaeology at (225) 342-8170.

Sincerely,

Scott Hutcheson
State Historic Preservation Officer

SH:RW:kc

enclosure

CONTRACTING ARCHAEOLOGISTS

Updated: October 14, 2008

The State of Louisiana does not license, register, or otherwise approve professional archaeologists.

The Department of Culture, Recreation and Tourism has found that a listing of archaeologists active in Louisiana is often a useful guide for those contracting agencies requiring the services of an archaeological consultant. The appearance of names of individuals and firms on the following list in no way implies recommendation or endorsement by the State of Louisiana. There are other competent, qualified archaeologists living both in-state and out-of-state. This list is furnished as a state service only upon request.

Contracting agencies are advised to contact several archaeological consultants, as price and availability for work vary greatly.

AR Consultants, Inc.
S. Alan Skinner, PhD
11020 Audelia Road, Suite C 105
Dallas, TX 75243
Office: (214) 369- 0478
Fax: (214) 221- 1519
Cell: (214) 906-8021
arcdigs@aol.com

ArcCom Archaeological Compliance Consultant
Thomas I. McIntosh, RPA
4202 Mandell Street
Houston, TX 77006
Phone (505) 982-2341
jeraii@aol.com

Archaeo-Geophysical Associates, LLC
Mr. Chester P. Walker, M.A.,RPA
8316 Hanbridge Lane
Austin, TX 78736
Phone: (512) 535-0976
chetwalker@aga-llc.net
http://www.aga-llc.net

Archeological and Environmental Consultants, LLC
Dr. Timothy K. Perttula
10101 Woodhaven Drive
Austin, TX 78753-4346
Phone: (512) 873-8131
Fax: (512) 873-8131
tkp4747@aol.com

Barr & Associates*
Mr. William B. Barr
2636 Highway 394
DeRidder, LA 70634
Phone/Fax (888) 532-0392
bbbarch1@aol.com

BIO-WEST, Inc.*
Jeffrey M. Enright
Maritime Archaeologist
Office: (512) 990-3954
Cell: (512) 801-5683

Bluestone Research, LLC
Dr. Allan Morton, RPA
162 Point Anne Dr.
Hartfield, VA 23071
Phone (804) 545-3151
allan@bluestoneresearch.com
www.bluestoneresearch.com

Brazos Valley Research Associates
William E. Moore, RPA
813 Beck Street
Bryan, TX 77803
Phone (979) 823-1148
bvracrm@suddenlink.net

Brockington Cultural Resources Consulting
Thomas G. Whitley
6611 Bay Circle, Suite 220
Norcross, Georgia 30071
Phone (770) 662-5807
Fax (770) 662-5824
tomwhitley@brockington.org

C & C Technologies, Inc*
Mr. Robert Church or
Mr. Daniel J. Warren
730 E. Kaliste Saloom Road
Lafayette, LA 70508
Phone (337) 261-0660
Fax (337) 261-0192

Carved Trowel Archaeology, Ltd.
Dr. Jon Gibson
355 Coleman Loop
Homer, LA 71040
Phone (318) 927-4915
jgibson@bayou.com

Coastal Environments, Inc.*
Dr. David Kelley or
Mr. Richard Weinstein
1260 Main Street
Baton Rouge, LA 70802
Phone (225) 383-7455
Fax (225) 383-7925
dkelley@coastalenv.com
rweinstein@coastalenv.com

CRC, International Archaeology & Ecology, LLC*
Mr. Robert P. d'Aigle, RPA
555 FM 646, Suite 428
Dickinson, TX 77539
Phone (832) 592-9549
Fax (832) 225-1409
www.culturalresource.com
postoffice@culturalresource.com

Cultural Resource Analysts, Inc.
Andrew V. Martin, RPA
Steve D. Creasman, RPA
151 Walton Avenue
Lexington, KY 40508
Phone (859) 252-4737
www.crai-ky.com

Deep East Texas Archaeological Consultants
Victor J. Galan
4215 Red Oak
Nacogdoches, TX 75965
Phone (936) 560-4670

Earth Search, Inc.*
Dr. Jill-Karen Yakubik
P.O. Box 770336
New Orleans, LA 70177-0336
Phone (504) 947-0737
Fax (504) 947-1714
jill@earth-search.com

Earth Services & Equipment, Inc.
Cheryl L. Bommarito, EP, MA, RPA
Ronald F. Bacon, MS
Southeast Office:
1367 Marina Drive
Slidell, LA 70458
Phone (985) 641-4129
Fax (985) 641-4149
cbommarito@earthservices.net
rfbacon@earthservices.net

Engineering-Environmental Management, Inc.
Mr. Jeffrey Hokanson, M.A., RPA
9563 S. Kingston Court
Englewood, CO 80112
Phone (303) 754-4200
Fax (303) 721-9202
jhokanson@e2m.net
Additional office locations in NM, VA, and CA

Environment & Archaeology, LLC
David Breetzke, RPA
7736 Hwy. 42, Suite D3/5
Florence, Kentucky 41042
Phone: (859) 746-1778
(859) 746-1788

GAI Consultants, Inc.
Mr. Benjamin Resnick
385 East Waterfront Drive
Homestead, PA 15120-5005
Phone (412) 476-2000, Ext. 1200
Fax (412) 476-2020
b.resnick@gaiconsultants.com

Geo-Marine. Inc.
Ms. Melissa M. Green
2201 K Avenue, Suite A2
Plano, TX 75074
(972) 423-5480 voice
(972) 422-2736 fax
mgreen@geo-marine.com
www.geo-marine.com

Great Rivers Archaeological Services
Vincent Versluis, RPA
6038 Lakeview Drive
Burlington, KY 41005
Phone (859) 689-1360
Cell (859) 916-0042
v.versluis@juno.com

Gulf South Research Corporation
Mr. John Lindemuth or
Mr. Carl Welch
P.O. Box 83564
Baton Rouge, LA 70884-3564
Phone (225) 757-8088
Fax (225) 761-8077
johnl@gsrcorp.com

Halff Associates, Inc.
Mr. Leonard R. Voellinger, RPA
4030 West Braker Lane, Ste. 450
Austin, TX 78759
Phone (512) 252-8184
Fax (512) 252-8141
lvoellinger@halff.com

History, Incorporated
Mr. Artis West, MA, RPA
1375 Union Industrial Court, Suite A
Alpharetta, GA 30004
Phone (770) 667-2060
Fax (770) 667-2041
artis.west@HistoryIncOnline.com
www.HistoryIncOnline.com

HRA Gray & Pape, LLC
Mr. Jim Hughey
Mr. Thomas I. McIntosh, RPA
1428 West Alabama St.
Houston, TX 77006
Phone (713) 541-0473
Fax (713) 541-0479
jhughey@hragp.com
tmcintosh@hragp.com
www.HRAGP.com

Dr. Carl Kuttruff
621 Albert Hart Dr.
Baton Rouge, LA 70808
Phone (225) 767-6605
ckuttruff@bellsouth.net

New South Associates
Dr. J.W. Joseph or
Natalie Adams
6150 East Ponce de Leon Ave.
Stone Mountain, GA 30083
Phone (770) 498-4155
Fax (770) 498-3809
jwjoseph@newsouthassoc.com
www.newsouthassoc.com

Northwestern State University Cultural Resource Office
Dr. Tommy Hailey
Natchitoches, LA 71497
Phone (318) 357-6130
(318) 357-4453
Fax (318) 357-5273
haileyt@nsula.edu

Panamerican Consultants, Inc.*
Steve James or
Drew Buchner
91 Tillman Street
Memphis, TN 38111
Phone (901) 454-4733
Fax (901) 454-4736
panamtn@mindspring.com
panamconsultants.com

Pathfinder CRM, LLC
Mr. Robert C. Vogel
168 W. Main Street
Spring Grove MN 55974
Phone (507) 498-3810
pathfindercrm@springgrove.coop
www.pathfindercrm.com

PBS&J*
Mr. Robert Rogers
6504 Bridge Point Parkway, Ste 200
Austin, TX 78730
Phone (512) 342-3340
Fax (512) 327-2453
rmrogers@pbsj.com

Precision Cartographics
Mr. Gary Joiner or
Dr. C. Wade Meade
1029 Blanchard Place
Shreveport, LA 71104
Phone (318) 222-6122
Fax (318) 222-0662
caesar@latech.edu

Prentice Thomas & Associates, Inc.
Dr. Prentice M. Thomas, Jr.
Ms. Jan Campbell
Ms. Carrie Williams-Bourgeois
P.O. Box 4246
Fort Walton Beach, FL 32549
Phone (850) 243-5992
Fax (850) 664-7835
jcampbell@pta-crm.com

R. Christopher Goodwin & Associates, Inc.*
Mr. William P. Athens or
Dr. R. Christopher Goodwin
309 Jefferson Highway, Suite A
New Orleans, LA 70121
Phone (504) 837-1940
Fax (504) 837-1550

Dr. Katherine M. Roberts
Archaeologist/Paleoethnobotanitst
901 South National Avenue
Springfield, MO 65897
Phone (417) 836-6074
Fax (417) 836-4772
KittyRoberts@MissouriState.edu

Southeastern Archaeological Research, Inc. (SEARCH)*
Michael C. Krivor, M.A., RPA
Jason M. Burns, M.A., RPA
315 NW 138th Terrace
Jonesville, FL 32669
Phone: (352) 333-0049
Fax: (352) 333-0069
www.searchinc.com

Sphere 3 Environmental, Inc.
Marc Tiemann, RPA
1501 Bill Owens Parkway
Longview, TX 75604
Phone (903) 297-4673
Fax (903) 297-4675
Tiemann@sphere3environmental.com
www.sphere3environmental.com

Surveys Unlimited Research Associates, Inc.
Dr. Malcolm K. Shuman
P.O. Box 14414
2931 Government Street
Baton Rouge, LA 70898-4414
Phone (225) 381-8201
(225) 346-8072
Fax (225) 381-8206
mkshuman@suraine.com

Tejas Archaeology
R.J. Bo Nelson
344 CR 4154
Pittsburg, TX 75686
Phone (903) 856-5291
RboNelson@aol.com

University of Louisiana Lafayette Department of Sociology and Anthropology
Dr. Mark A. Rees
P.O. Box 40198
Lafayette, LA 70504-0198
Phone (337) 482-6045
Fax (337) 482-5374
markrees@louisiana.edu

University of Tennessee Archaeological Research Laboratory
Department of Anthropology
Dr. Boyce Driskell
Dr. Elizabeth DeCorse,
Dr. Kandace D. Hollenbach
Room 237, Middlebrook Building
Knoxville, TN 37996-0060
Phone: (865) 974-6525
Fax: (865) 946-1883
http://archaeology.as.utk.edu
bdriskel@utk.edu
ekellard@utk.edu
kdh@utk.edu

URS Corporation*
Martin Handly
Roaber Lackowicz
7389 Florida Blvd, Ste 300
Baton Rouge, LA 70806
Phone (225) 922-5700
Fax (225) 922-5701
Martin_handly@urscorp.com
Rob_lackowicz@urscorp.com

Weaver & Associates, LLC
Guy Weaver
Jeremy Blazier
Nicole Palmer
2563 Broad Avenue
Memphis, TN 38112
Phone (901) 452-7554
Fax (901) 452-7803
www.weaverassociatesllc.com

Westwood Professional Services, Inc.
Dean T. Sather, M.A., RPA
Steven J. Blondo, M.A.
7699 Anagram Drive
Eden Prairie, MN 55344
Phone (952) 937-5150
Dean.Sather@westwoodps.com
Steven.Blondo@westwoodps.com

William Self Associates, Inc.
James Karbula, PhD
16238 Highway 620, Ste F-400
Austin, TX 78717
Phone (512) 394-7477
Fax (512) 527-3078
jkarbula@williamself.com

* Capable of Underwater Archaeological Investigations

MITCHELL J. LANDRIEU
LIEUTENANT GOVERNOR

State of Louisiana
OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT

PAM BREAUX
SECRETARY

SCOTT HUTCHESON
ASSISTANT SECRETARY

June 26, 2009

Mr. Niels Larsen
LA Department of Environmental Quality
Permits Application Administrative Review Group
Permit Support Services Division
Office of Environmental Services
P.O. Box 4313
Baton Rouge, LA 70821-4313

Re: Lake Charles Gasification Facility
Lake Charles Cogeneration LLC
Agency Interest No. 160213
Activity No. PER20090001
Lake Charles, Calcasieu Parish, LA

Dear Mr. Larsen:

Reference is made to our letter dated March 9, 2009 (copy enclosed), in which we informed your agency that a Phase I survey had been requested of the proposed Lake Charles Gasification Facility, due to the presence of a recorded archaeological site (16CM29) within the project boundaries. We asked that issuance of the LPDES permit be withheld pending review of the survey results by the State Historic Preservation Office.

Please be advised that we are in receipt of documentation dated June 9, 2009, concerning the archaeological site assessment made of site 16CU29 by URS (copy enclosed). Field investigations resulted in the delineation of expanded boundaries for this site and the assessment that the site was not eligible for listing on the National Register of Historic Places due to a lack of depositional integrity and limited research potential. As we concur with this assessment, addition investigations are not warranted. Consequently, we have no objection to issuance of the LPDES permit.

Should you have any questions concerning our comments, do not hesitate to contact Duke Rivet in the Division of Archaeology at (225) 219-4598 or be e-mail at drivet@crt.state.la.us.

Sincerely,

Scott Hutcheson
State Historic Preservation Officer

SH:DR:s

Enclosures: as stated

c: Mr. Martin Handly
URS Corporation
7389 Florida Blvd., Suite 300
Baton Rouge, LA 70806

JAY DARDENNE
LIEUTENANT GOVERNOR

State of Louisiana

OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT

CHARLES R. DAVIS
DEPUTY SECRETARY

PAM BREAUX
ASSISTANT SECRETARY

25 April 2012

Joel Watkins
Cultural Resource Analyst
Office of Archaeological Research
13075 Moundville Archaeological Park
Moundville, AL 35474

Re: Draft Report
La Division of Archaeology Report No. 22-4007
Phase I Cultural Resource Survey of the Proposed Lake Charles Pipeline Lateral Project Located near Sulphur, Calcasieu Parish, Louisiana

Dear Mr Watkins:

We acknowledge receipt of your report dated 21 November 2011 and received in our office 16 April 2012, along with two copies of the above-referenced report. We have completed our review of this report and offer the following comments.

In the Abstract, please provide the total project acreage. We appreciate the effort to inspect all of the pimple mounds encountered within the project ROW. We request that a site form be completed for the Harvey Cemetery. This request reflects recent legislative acts that give our office regulatory responsibilities for many cemeteries and so we are making a concerted effort to record all that are encountered during projects.

We concur that site 16CU73 is not eligible for nomination to the National Register of Historic Places and that if the pipeline is directionally drilled under the Harvey Cemetery, no historic properties will be impacted by this project, and that no further work is necessary.

We look forward to receiving two bound copies of the final report with the comments addressed as appropriate, along with a pdf of the report. If you have any questions, please contact Chip McGimsey in the Division of Archaeology by email at cmcgimsey@crt.la.gov or by phone at 225-219-4598.

Sincerely,

Pam Breaux

Pam Breaux
State Historic Preservation Officer

PB:crm

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November 1, 2011

James Karbula
William Self Associates, Inc.
16238 Highway 620, Ste. F-400
Austin, Texas 78717

Re: Project review under Section 106 of the National Historic Preservation Act of 1966 and the Antiquities Code of Texas
Denbury Onshore, LLC, CO2 Sequestration Monitoring, Verification, and Accounting (MVA), Hastings Field, Brazoria County, Texas

Dear Mr. Karbula:

Thank you for your correspondence describing the above referenced project. This letter serves as comment on the proposed undertaking from the Executive Director of the Texas Historical Commission and the State Historic Preservation Officer. As the state agency responsible for administering the Antiquities Code of Texas, these comments also provide recommendations on compliance with state antiquities laws and regulations.

The review staff, led by Jeff Durst, has completed its review. After reviewing the documentation, we concur that there exists a very low probability that properties located within the above referenced project area and eligible for inclusion in the National Register of Historic Places (National Register) and/or for formal designation as a State Archeological Landmark, will be impacted by the proposed research project. The above referenced project may proceed without consultation with this office, provided that no significant archeological deposits are encountered during development activities on the property.

At your request we have attached a copy of the previous correspondence dating to 2010 that we have on file related to this project.

Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we can be of further assistance, please contact Jeff Durst at 512/463-6096.**

Sincerely,

for
Mark Wolfe, State Historic Preservation Officer

MW/jjd

Attachment: Review of Public Notice issued by U.S. Army Corps of Engineers Galveston District

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Public Notice

U.S. Army Corps Of Engineers Galveston District

Permit Application No:	SWG-2010-00194
Date Issued:	8 July 2010
Comments Due:	9 August 2010

U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT

PURPOSE OF PUBLIC NOTICE: To inform you of a proposal for work in which you might be interested. It is also to solicit your comments and information to better enable us to make a reasonable decision on factors affecting the public interest.

AUTHORITY: This application will be reviewed pursuant to Section 404 of the Clean Water Act.

APPLICANT: Denbury Onshore, LLC
5100 Tennyson Parkway, Suite 3000
Plano, Texas 75024-4932

AGENT: Project Consulting Services, Inc.
3300 West Esplanade Avenue South, Suite 500
Metairie, Louisiana 70002-3447
Telephone: 504-833-5321
POC: Richard Leonhard

LOCATION: The project is located on a 47-acre tract within an existing oil field located approximately 4,500 feet southwest of the State Highway 35 and County Road 128 intersection, in Brazoria County, Texas. The project can be located on the U.S.G.S. quadrangle map entitled: Manvel and Pearland, Texas. Approximate UTM Coordinates in NAD 27 (meters): Zone 15; Easting: 280760; Northing: 3265475. Latitude: 29° 29' 58.69" N. Longitude: 95° 15' 41.71" W (NAD 27).

PROJECT DESCRIPTION: The applicant proposes permanent fill impacts to 7.08 acres of herbaceous and shrub scrub jurisdictional wetlands during the construction of a foundation for a facility designed to support the sequestering and recovery of CO_2, all of which are associated with enhanced oil recovery processes for reserves located within the project area. The proposed project site is located within an existing oil field and is in an area presently used for farming and livestock grazing. The area is dominated by yaupon (*Ilex vomitoria*), Chinese tallow (*Sapium sebiferum*), little bluestem (*Schizachyrium scoparium*), bushy bluestem (*Andropogons glomeratus*) and southern dewberry (*Rubus trivialis*).

The project site was selected due to the fact that it is centrally located within the Hastings Field. The project footprint was designed and situated to avoid jurisdictional wetland impacts to the maximum extent practicable. Of the 19.2 acres of jurisdictional wetlands on the tract, 12.12 acres of wetlands will be avoided. Existing infrastructure is located directly adjacent to the site, which minimizes the potential for additional wetland impacts. The applicant proposes to mitigate for the proposed unavoidable impacts to 7.08 acres of wetlands by donating a 60-acre tract composed of cypress-tupelo swamp to the Big Thicket National Preserve. The mitigation tract is located directly south of the tract that was previously utilized as mitigation for the Denbury Green Pipeline project, permitted under SWG-2007-01963.

NOTES: This public notice is being issued based on information furnished by the applicant. This information has not been verified. The applicant's plans in 6 sheets, Alternative Analysis in 2 sheets and Mitigation Plan in 3 sheets are enclosed.

A preliminary review of this application indicates that an Environmental Impact Statement (EIS) is not required. Since permit assessment is a continuing process, this preliminary determination of EIS requirement will be changed if data or information brought forth in the coordination process is of a significant nature.

Our evaluation will also follow the guidelines published by the U.S. Environmental Protection Agency pursuant to Section 404 (b)(1) of the Clean Water Act (CWA).

OTHER AGENCY AUTHORIZATIONS: Texas Railroad Commission certification is required. Texas Coastal Zone consistency certification is required. The applicant has stated that the project is consistent with the Texas Coastal Management Program goals and policies and will be conducted in a manner consistent with said program.

NATIONAL REGISTER OF HISTORIC PLACES: The staff archaeologist has reviewed the latest published version of the National Register of Historic Places, lists of properties determined eligible, and other sources of information. The following is current knowledge of the presence or absence of historic properties and the effects of the undertaking upon these properties:

The permit area has been so extensively modified that little likelihood exists for the proposed project to impinge upon a historic property, even if present within the affected area.

THREATENED AND ENDANGERED SPECIES: Preliminary indications are that no known threatened and/or endangered species or their critical habitat will be affected by the proposed work.

ESSENTIAL FISH HABITAT: This notice initiates the Essential Fish Habitat consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. Our initial determination is that the proposed action would not have a substantial adverse impact on Essential Fish Habitat or federally managed fisheries in the Gulf of Mexico. Our final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the National Marine Fisheries Service.

PUBLIC INTEREST REVIEW FACTORS: This application will be reviewed in accordance with 33 CFR 320-332, the Regulatory Programs of the Corps of Engineers (Corps), and other pertinent laws, regulations and executive orders. The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors, which may be relevant to the proposal, will be considered: among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs and, in general, the needs and welfare of the people.

SOLICITATION OF COMMENTS: The Corps is soliciting comments from the public, Federal, State, and local agencies and officials, Indian tribes, and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Impact Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

This public notice is being distributed to all known interested persons in order to assist in developing facts upon which a decision by the Corps may be based. For accuracy and completeness of the record, all data in support of or in opposition to the proposed work should be submitted in writing setting forth sufficient detail to furnish a clear understanding of the reasons for support or opposition.

PUBLIC HEARING: Prior to the close of the comment period any person may make a written request for a public hearing setting forth the particular reasons for the request. The District Engineer will determine whether the issues are substantial and should be considered in the permit decision. If a public hearing is warranted, all known interested persons will be notified of the time, date, and location.

CLOSE OF COMMENT PERIOD: All comments pertaining to this Public Notice must reach this office on or before **9 August 2010**. Extensions of the comment period may be granted for valid reasons provided a written request is received by the limiting date. **If no comments are received by that date, it will be considered that there are no objections**. Comments and requests for additional information should be submitted to:

Kristy Farmer
Regulatory Branch, CESWG-PE-RE
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229
409-766-3935 Phone
409-766-6301 Fax

DISTRICT ENGINEER
GALVESTON DISTRICT
CORPS OF ENGINEERS

NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA

U.S. DEPARTMENT OF ENERGY

August 15, 2012

Ms. Pam Breaux
State Historic Preservation Officer
Office of Cultural Development
Louisiana Department of Culture, Recreation & Tourism
P.O. Box 44247
Baton Rouge, Louisiana 70804-44247

SUBJECT: Initiation of Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Ms. Breaux:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, the DOE is consulting with the Louisiana State Historic Preservation Officer (SHPO) on the proposed project.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, in Brazoria County, Texas. Please note that as of June 1, 2012, the name of Lake Charles Cogeneration, LLC was changed to Lake Charles Clean Energy, LLC. Historical references to Lake Charles Cogeneration (LCC) Gasification are now LCCE Gasification.

During the DOE demonstration phase of the proposed project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard

626 Cochrans Mill Road, P.O. Box 10940, Pittsburgh, PA 15236
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cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field during the demonstration period.

As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the Lake Charles CCS Project and its associated CO_2 capture and compression facilities in Calcasieu Parish, Louisiana;
- the Lake Charles CCS Project proposed 11.1 mile CO_2 pipeline in Calcasieu Parish Louisiana; Lake Charles CCS Project proposed Research Monitoring, Verification, Analysis (MVA) program for the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation in Brazoria County, Texas; and
- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (connected action).

DOE has determined that the area of potential effects (APE) for the undertaking will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCCE Gasification, which are located in Calcasieu Parish, Louisiana and in Brazoria County, Texas. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Calcasieu Parish, Louisiana includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area (see Enclosure 2).
- the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest.

The APE in Texas includes the location of the proposed CO_2 sequestration in an ongoing commercial enhanced oil recovery operation and Research MVA program at the existing Hastings Oil Field in Brazoria County, Texas.

Cultural resources investigations have been conducted within portions of the APE in Calcasieu Parish, Louisiana, including: Phase I archaeological survey of the property that contains the locations of the Lake Charles CCS Project and LCCE Gasification project; Phase I cultural resources survey of the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline, including extra workspace and access roads; and Phase IA cultural resources investigations of offsite facilities associated with the LCCE Gasification project (raw water, hydrogen, potable water, methanol and sulfuric acid pipelines; an overhead transmission line; a construction laydown area; and construction parking area). A table summarizing these cultural resources investigations is in Enclosure 3.

Cultural resources investigations conducted at the locations of the Lake Charles CCS Project and LCCE Gasification project consisted of: (1) a Phase I cultural resources investigation for the entire property in 2001 by Earth Science, Inc. (Smith et al. 2001 as cited in Handly 2009), which identified a portion of one archaeological site, Site 16CU29, a prehistoric shell midden, and (2) additional archaeological investigations of Site 16CU29 in 2009 by URS Corporation, which determined that the site had been adversely impacted by naturally-occurring erosion and /or redeposition (possibly as a result of hurricane storm surges between 2001 and 2009), and was not eligible for inclusion in the National Register of Historic Places (NRHP) (Handly 2009). The Louisiana SHPO concurred with URS Corporation's assessment that Site 16CU29 was not eligible for inclusion in the NRHP due to a lack of depositional integrity and limited research potential, and indicated that no further investigations were necessary (Hutcheson 2009). Documentation of the previous consultation with your office by other parties regarding the results of the cultural resources investigations for the Lake Charles CCS Project and LCCE Gasification project, which was conducted as part of the air permitting process for the Lake Charles Gasification Facility, is in Enclosure 4.

Cultural resources investigations conducted for the proposed new 11.1-mile long CO_2 pipeline consisted of a Phase I cultural resources investigation conducted in 2011 by the University of Alabama's Office of Archaeological Research (Watkins and Futato 2011). Results of these investigations consisted of the identification of one historic archaeological site, 16CU73, and one modern cemetery, the Hardey Family Cemetery established in 1988, within the APE. Site 16CU73 was recommended not eligible for listing in the NRHP and no further archaeological investigations were recommended for the site. Recommendations for avoiding impacts on the Hardey Family Cemetery consisted of installation of the proposed pipeline beneath the cemetery at a minimum depth of 10 feet (3 meters) below the surface of the cemetery.

The report documenting these cultural resources investigations, entitled *A Phase I Cultural Resources Survey of the Proposed Lake Charles Pipeline Lateral Project Located near Sulphur, Calcasieu Parish, Louisiana (Draft Report, dated November 18, 2011)*, was submitted separately to your office for review and comment by the consultant on behalf of the Applicant. The Louisiana SHPO concurred with the University of Alabama's recommendation that archaeological site 16CU73 was not eligible for the NRHP and no further archaeological investigations were required and concurred with the

Applicant's proposed measures to avoid impacts on the Hardey Family Cemetery (Breaux 2012). Documentation of the previous consultation with your office by other parties regarding the results of the cultural resources investigation for the CO_2 pipeline is in Enclosure 4.

Cultural resources investigations conducted for the proposed offsite facilities associated with the Lake Charles CCS Project and LCCE Gasification project consisted of Phase IA cultural resources investigations conducted in 2012 by URS (URS 2012 and Handly 2012 in Enclosure 5). Results of these investigations indicated that: no previously identified cultural resources, including resources listed in or determined eligible for listing in the National Register of Historic Places (NRHP), are located within the APE for the offsite facilities: portions of the APE have been previously surveyed for other unrelated projects or have been previously disturbed by prior construction; and portions of the APE may be considered sensitive for the presence of previously unidentified cultural resources. Additional Phase IB field investigations were recommended for the proposed offsite facilities to identify previously unrecorded aboveground resources (historic buildings and/or cemeteries) and below ground resources (archaeological sites).

The documentation for the Phase IA cultural resources investigations for the proposed offsite facilities, consisting of a report entitled *Lake Charles Cogeneration, LLC, Cultural Resources Assessment, Calcasieu Parish, Louisiana* (URS report dated July 2012) and a letter report regarding *Cultural Resources Evaluation - Lake Charles Cogeneration, LLC (LCC), Calcasieu Parish, Louisiana* (Handly 2012), are in Enclosure 5. They are provided to your office for review and comment pursuant to Section 106 of the NHPA.

DOE is not aware of any other previously conducted cultural resources investigations in other portions of the APE in Calcasieu Parish, Louisiana (i.e., the alignments of the proposed or alternative CO2 pipeline, the proposed methanol pipeline, and the proposed water supply line). DOE confirmed that no NRHP-listed historic properties or previously recorded standing structures or historic districts are located within the APE or a 0.5-mile radius around the APE in Calcasieu Parish (NPS 2011a, 2011b; Louisiana Department of Culture, Recreation and Tourism [CRT] 2011a).

In accordance with Section 106 of the NHPA, DOE is writing to seek your concurrence on the proposed project's APE in Calcasieu Parish, Louisiana, per 36 CFR 800.4(a)(1). DOE is also seeking your review of the cultural resources reports in Enclosure 5 and your comments on any issues or concerns for cultural resources or historic properties that might be affected by the proposed Project, per 36 CFR 800.4(a)(3).

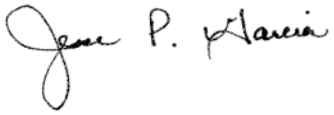
DOE has identified 11 federally recognized Indian tribes with a potential interest in the portions of the proposed Project in Louisiana (see Enclosure 6) and is also seeking information for any other parties that may have an interest in the Section 106 consultation process for the proposed Project per 36 CFR 800.3(f). DOE is conducting separate consultation with the Texas State Historic Preservation Officer (SHPO) and federally recognized Indian tribes and other consulting parties for the proposed new facilities in Brazoria County, Texas.

DOE looks forward to receiving your concurrence with the APE for the portions of the proposed Project that are in Calcasieu Parish, Louisiana per 36 CFR 800.4(a)(1) and your comments on the cultural resources reports in Enclosure 5 and on any issues or concerns for cultural resources or historic properties that might be affected by the proposed Project. DOE also looks forward to your assistance in identifying any parties that may have an interest in the Section 106 consultation for the proposed Project. Please forward the results of your review and any requests for additional information to our contractor:

Janine Whitken
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, New York 14086
(716) 684-8060 extension 2745
JWhitken@ene.com

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

cc: Amity Bass, Louisiana Department of Wildlife and Fisheries

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Calcasieu Parish, Louisiana
3. Summary Table for Cultural Resources Investigations Conducted within the Louisiana APE
4. Previous correspondence with the Louisiana SHPO for Lake Charles Gasification Facility
5. Phase IA Cultural Resources Reports for Proposed Offsite Facilities
6. List of federally recognized Indian tribes

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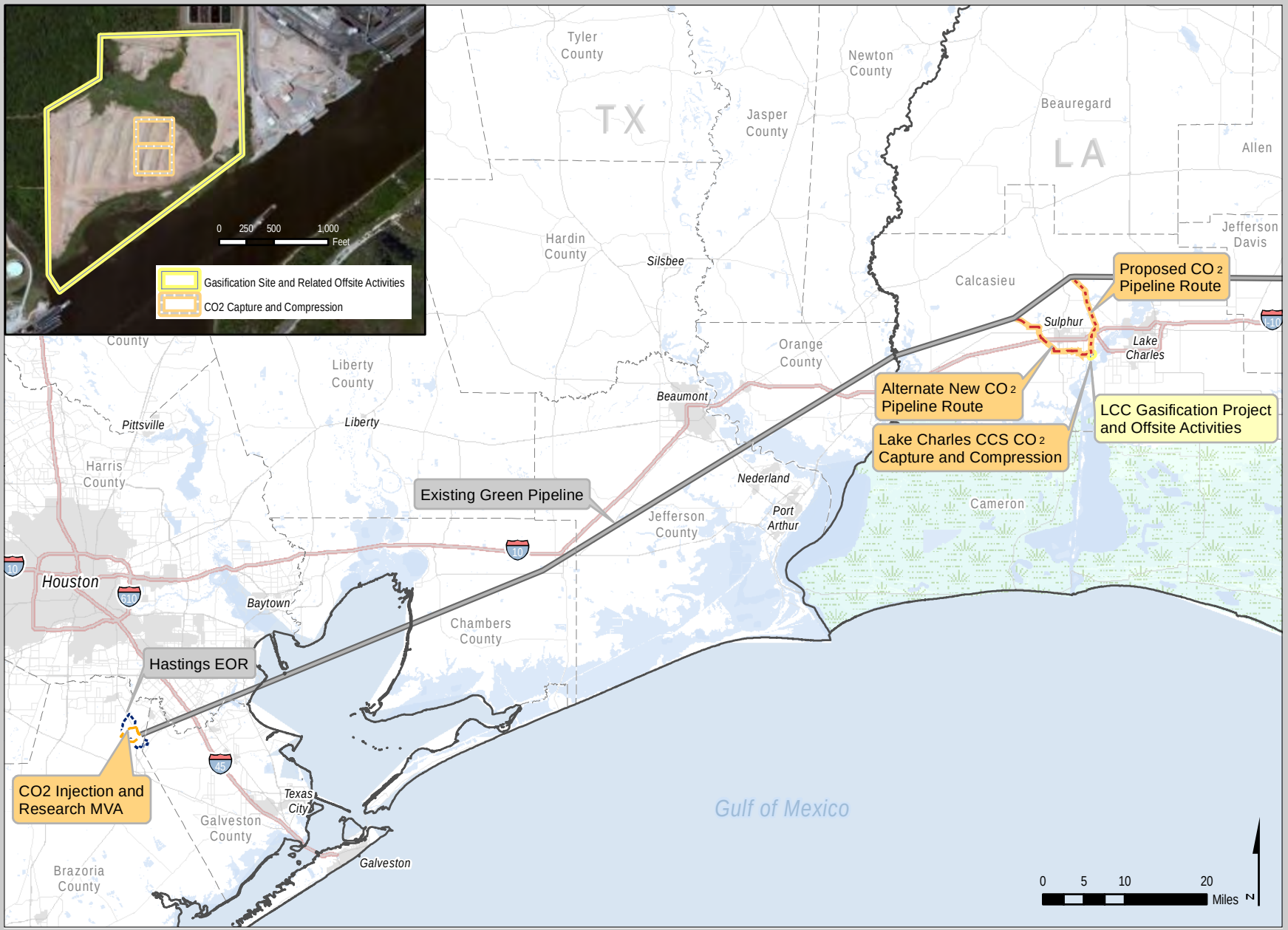
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Enclosure 1

Location of the Proposed
Lake Charles Carbon Capture and Sequestration Project and LCCE Gasification Project

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Lake Charles CCS Project (Proposed Project)

- Alternative CO2 Pipeline Route
- Proposed CO2 Pipeline Route
- CO2 Capture and Compression
- CO2 injection and Research MVA

LCC Gasification Project (Connected Action)

- Gasification Site and Related Offsite Activities

Existing EOR Operations

- Green Pipeline
- Hastings EOR
- State Boundary
- County Boundary
- Major waterbody

Figure 2.2-1
Lake Charles CCS Project
Overall Location
Texas and Louisiana

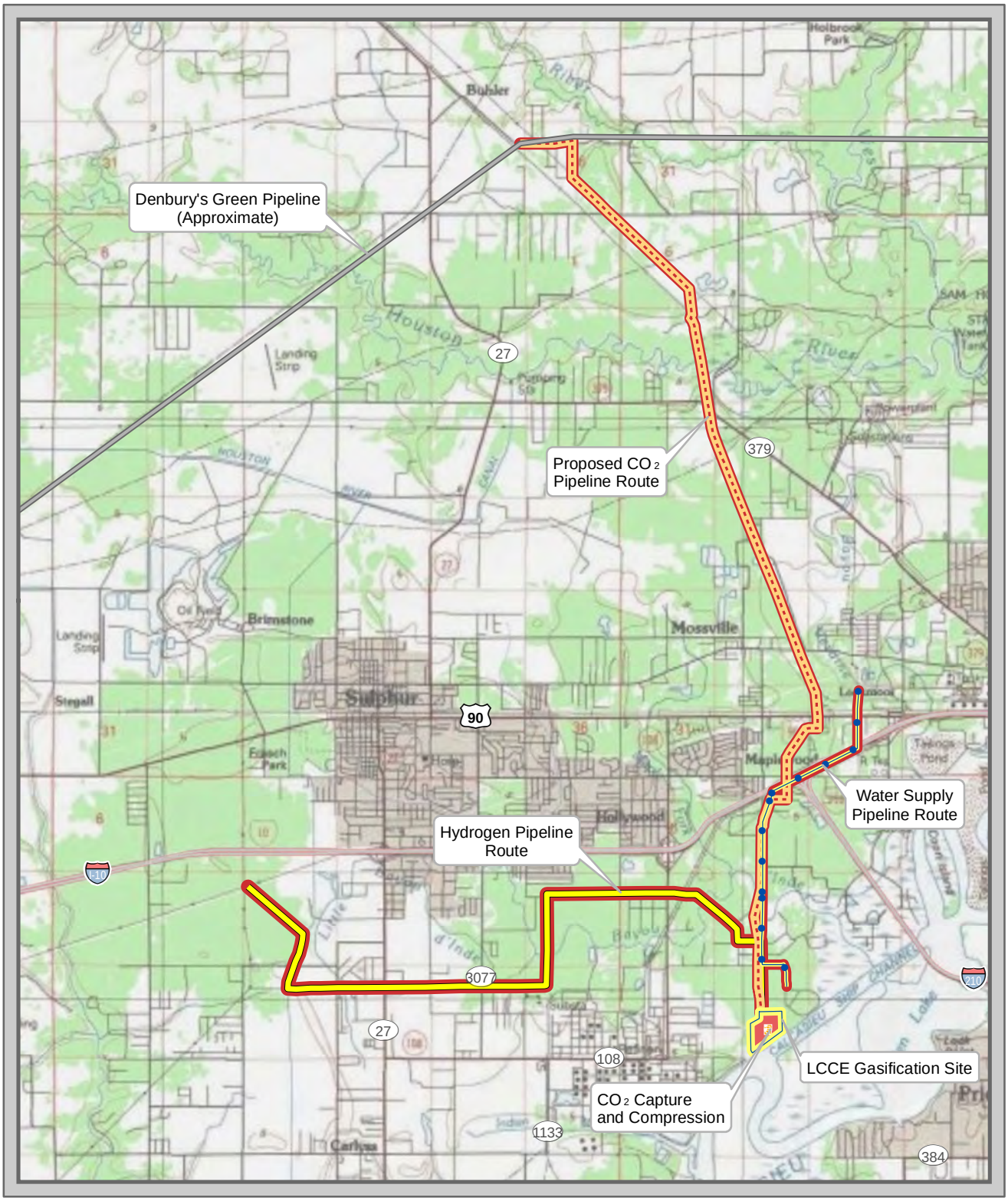
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Enclosure 2

Area of Potential Effect
for Proposed Lake Charles Carbon Capture and Sequestration Project and LCCE Gasification Project Facilities
in Calcasieu Parish, Louisiana

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Path: M:\Houston\Lake_Charles_Leucadia\Maps\MXDs\ThirdParty_EIS\May31_2012\Cultural\Updated\LA APE Overview Map_June27_2012.mxd



N

0 0.25 0.5 1 Miles

Area of Potential Effect (APE)

Lake Charles CCS Project (Proposed Action)

Alternative CO2 Pipeline Route

CO2 Capture and Compression

Proposed CO2 Pipeline Route

Existing Operations (Not in Project or Proposed Action)

Green Pipeline

LCCE Gasification Project (Connected Action)

Gasification Site and Related Offsite Activities

Water Supply Pipeline Route

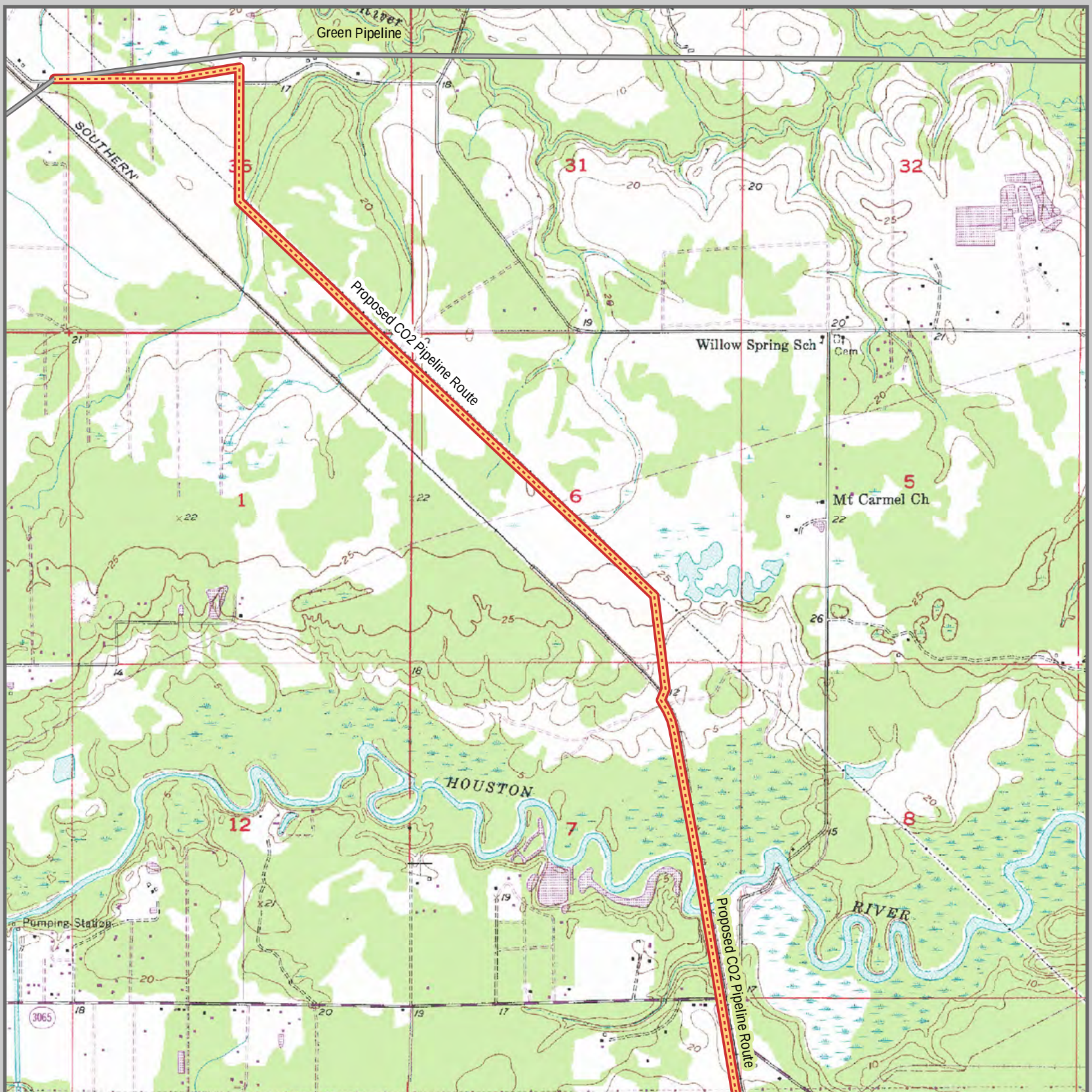
Hydrogen Pipeline Route

Figure 1
Overview of the APE (Area of Potential Effect) for the Proposed Facilities within Calcasieu Parish, Louisiana

Source: USGS 1:24,000 Friendswood (1998); Pearland (1983); Manval (1977); and Algoa (1977) Quadrangles.

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N

0 0.125 0.25 0.5 Miles

Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Area of Potential Effect (APE)

Existing Operations (Not in Project or Proposed Action)

Green Pipeline

Lake Charles CCS Project (Proposed Action)

CO2 Capture and Compression

Proposed CO2 Pipeline Route

Lake Charles Gasification Project (Connected Action)

Gasification Site

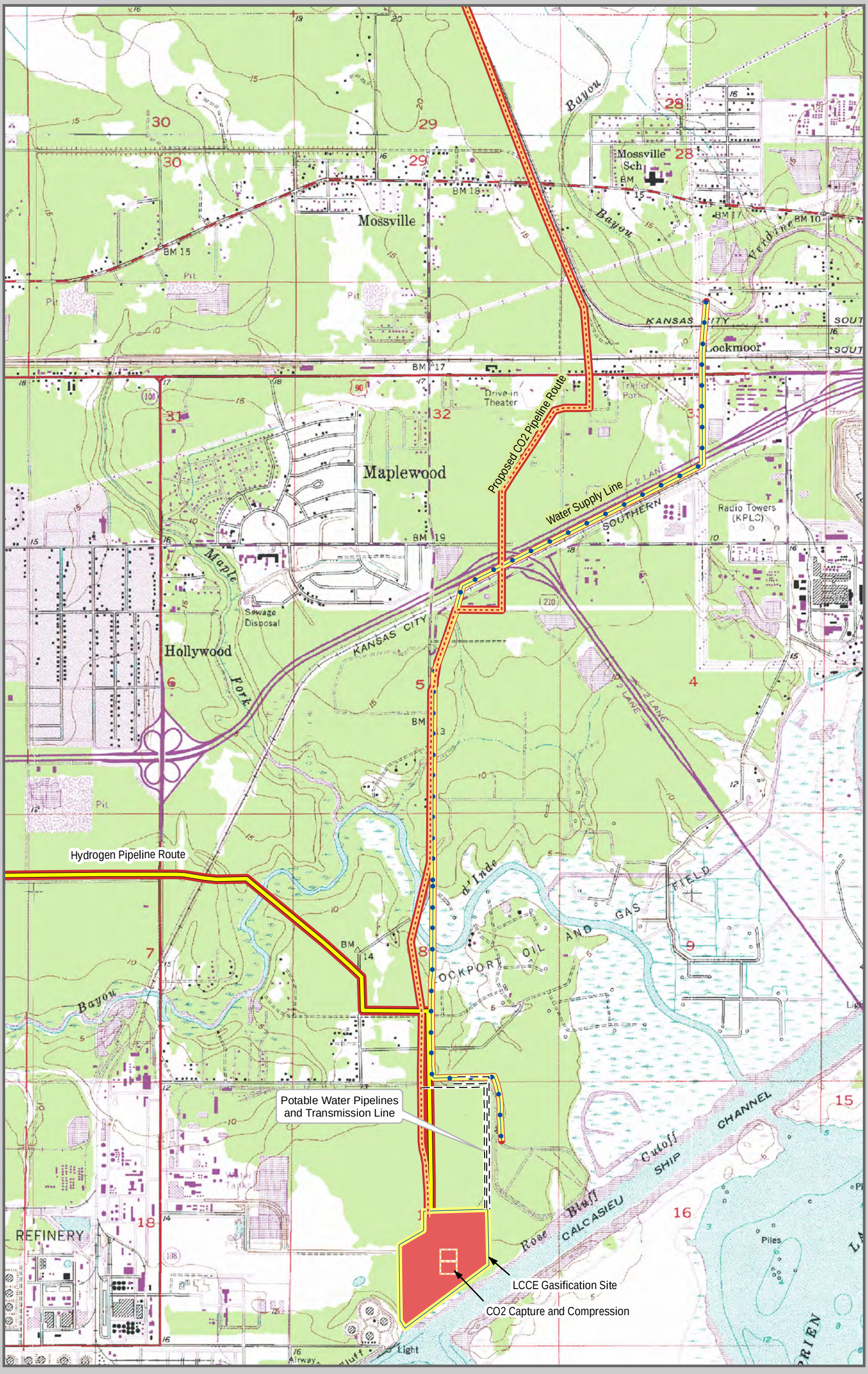
Water Supply Line

Hydrogen Pipeline Route

Figure 1-1
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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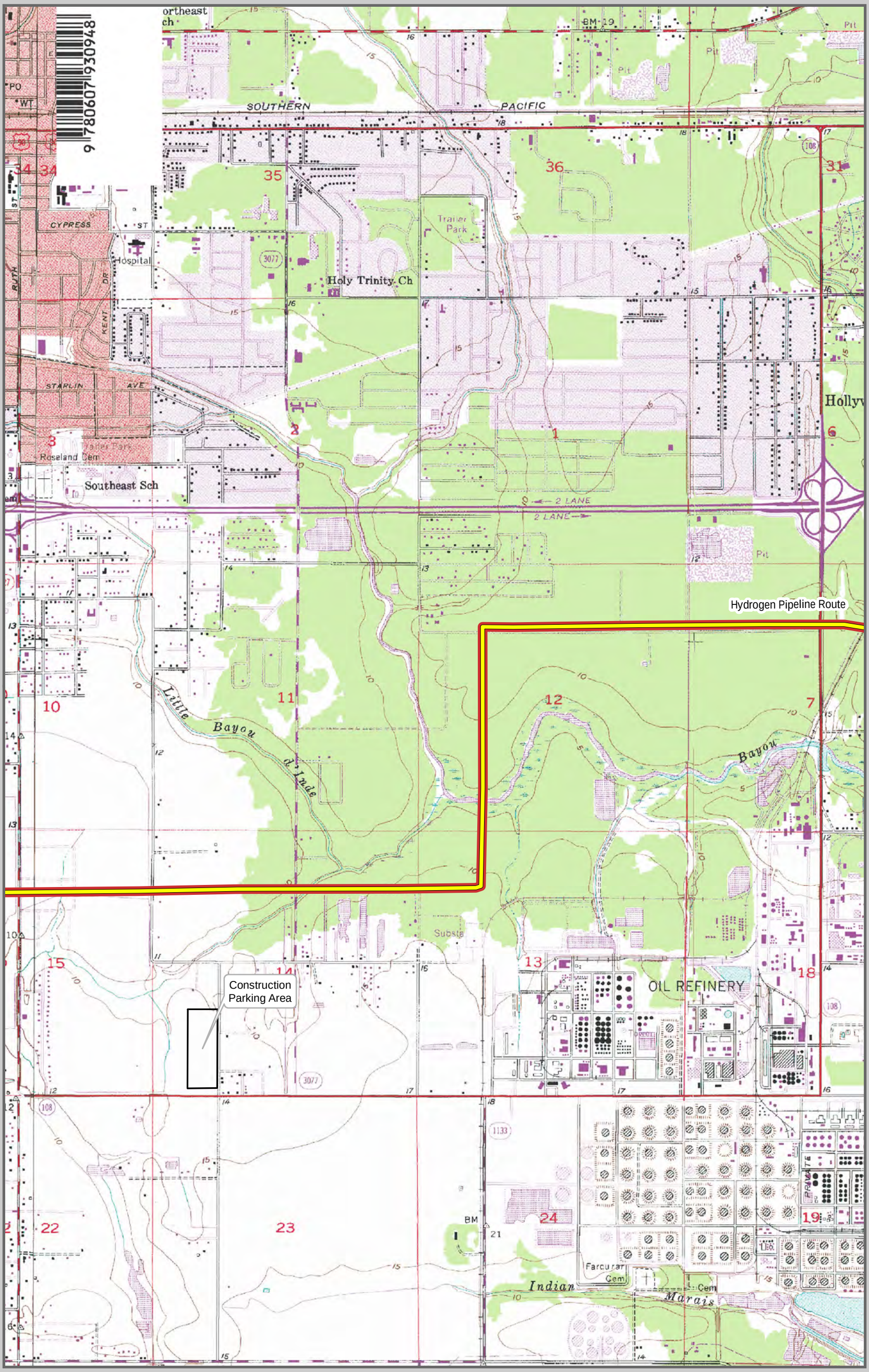


Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Figure 1-2
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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N

0 0.125 0.25 0.5 Miles

Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Area of Potential Effect (APE)

Existing Operations (Not in Project or Proposed Action)

Green Pipeline

Lake Charles CCS Project (Proposed Action)

CO2 Capture and Compression

Proposed CO2 Pipeline Route

Lake Charles Gasification Project (Connected Action)

Gasification Site

Water Supply Line

Hydrogen Pipeline Route

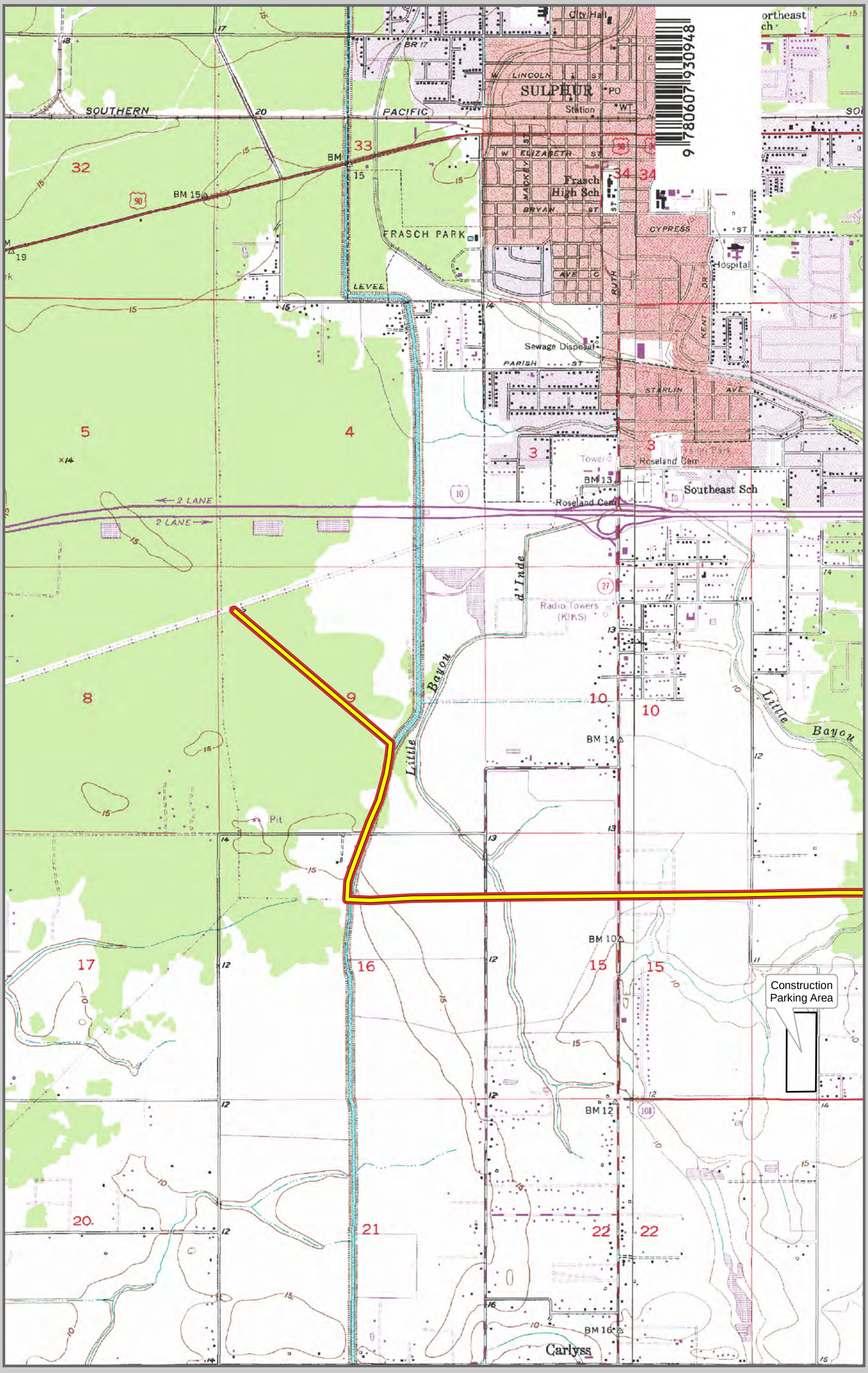
Figure 1-3

APE (Area of Potential Effect) for the Proposed Facilities within

Calcasieu Parish, Louisiana

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N

0 0.125 0.25 0.5 Miles

Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Area of Potential Effect (APE)

Existing Operations (Not in Project or Proposed Action)

Green Pipeline

Lake Charles CCS Project (Proposed Action)

CO2 Capture and Compression

Proposed CO2 Pipeline Route

Lake Charles Gasification Project (Connected Action)

Gasification Site

Water Supply Line

Hydrogen Pipeline Route

Figure 1-4

APE (Area of Potential Effect) for the Proposed Facilities within

Calcasieu Parish, Louisiana

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Enclosure 3

Summary Table for Cultural Resources Investigations
Conducted within the Louisiana APE

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Summary Table for Cultural Resources Investigations
Conducted within the Louisiana APEs

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
Lake Charles CCS Project (DOE proposes to fund)		
Carbon Capture and Compression	• 2 acid gas removal units to capture CO2 that would otherwise be emitted to the atmosphere • Produce CO2 in the purity needed for sequestration or EOR • 2 CO2 compressors pressurizing CO1 to 2,250 psig for transport in a supercritical state • Monitoring and metering equipment • All equipment is completely contained within the LCC Gasification Project Site.	Phase I archaeological survey of known site within parcel previously conducted by URS in 2009; one cultural resources present (prehistoric archaeological site 16CU 29); site recommended not eligible for NRHP (letter report dated June 15, 2009 [Handly]). LA SHPO concurred with NRHP-eligibility recommendation; no further investigations of property required. (letter dated June 26, 2009 [Hutcheson]). **Action: None**
CO2 Pipeline	• 11.1 mile pipeline from the CO2 compressors to an existing CO2 pipeline • Route includes a 50 foot permanent right of way (ROW) that would parallel existing ROWs (such as roadways, pipelines, railroads, transmission lines, and other linear features) throughout the length of the pipeline corridor to the extent practicable • CO2 meter station at tie-in to existing CO2 pipeline (Green Pipeline)	Phase I cultural resources survey (for archaeological and architectural resources) by University of Alabama; two cultural resources identified (historic archaeological site 16CU73; and modern [late 20th century] Hardey Cemetery). Both resources recommended not eligible for NRHP; drilling pipeline beneath cemetery recommended for Hardey Cemetery (draft report dated November 18, 2011 [Watkins and Futato]). LA SHPO concurred with results of survey: no NRHP-eligible resources were identified within the APE; no historic properties will be impacted by the project; and no further work is necessary (letter dated April 25, 2012 [Breaux]). **Action: None**
LCCE Gasification Project (Connected Action, not under consideration for DOE funding)		

Summary Table for Cultural Resources Investigations
Conducted within the Louisiana APEs

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
Gasification Plant	• Provides CO2 to the Lake Charles CCS Project • Petroleum coke gasification facility to produce methanol, hydrogen, and sulfuric acid on a 70 acre site in Calcasieu Parish • Site preparation of clearing, grading, raising the elevation currently being performed under USACE permit, including 26 acres of wetland mitigation implemented by the Port of Lake Charles • Construction expected to begin Fall 2012 and continue for 40 months	Phase I archaeological survey of known site within parcel previously conducted by URS in 2009; one cultural resources present (prehistoric archaeological site 16CU 29); site recommended not eligible for NRHP (letter report dated June 15, 2009 [Handly]). LA SHPO concurred with NRHP-eligibility recommendation; no further investigations of property required. (letter dated June 26, 2009 [Hutcheson]). **Action: None**
Offsite Activities	• 4 mile Raw Water Pipeline from Sabine River Canal. Route includes a 50 foot permanent ROW and 50 to 250 foot construction ROW that would parallel existing roadways, pipelines, railroads, transmission lines, and other linear features to the extent practicable. Leucadia would own and operate the raw water pipeline.	Phase IA cultural resources survey for archaeological and architectural resources) by URS; no cultural resources identified; further investigations of those areas that have not been previously disturbed or surveyed for cultural resources recommended (letter report dated May 16, 2012 [Handly]). **Action: Letter report is submitted with this consultation letter for review and comment by the LA SHPO.**
	• 8.5 mile Hydrogen Pipeline to transport hydrogen to Air Products in, Sulphur, Louisiana. Route includes a 50 foot permanent ROW and 75 foot construction ROW that would parallel existing roadways, pipelines, railroads, transmission lines, and other linear features to the extent practicable. The hydrogen pipeline would be owned and operated by Air Products.	Phase IA cultural resources survey (for archaeological and architectural resources) by URS; no cultural resources identified; further investigations of those areas that have not been previously disturbed or surveyed for cultural resources recommended (letter report dated May 16, 2012 [Handly]). **Action: Letter report is submitted with this consultation letter for review and comment by the LA SHPO.**

Summary Table for Cultural Resources Investigations
Conducted within the Louisiana APEs

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
	• Offsite Construction Parking Area with shuttle buses to and from the Plant site. This site is partially cleared and graded.	Phase IA cultural resources survey (for archaeological and architectural resources) by URS; no previously recorded cultural resources identified within APE; further investigations of those areas that have not been previously disturbed or surveyed for cultural resources recommended (letter report dated May 16, 2012 [Handly]). **Action: Letter report is submitted with this consultation letter for review and comment by the LA SHPO.**
	• Potable Water Pipeline to provide access to existing city water currently supplying the Port of Lake Charles. This work would take place within currently developed ROWs.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (letter report dated May 16, 2012 [Handly]). **Action: Letter report is submitted with this consultation letter for review and comment by the LA SHPO.**
	• Natural Gas Pipeline to provide start up fuel. This work includes upgrade to an existing line and new line and would take place within currently developed ROWs.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). **Action: Report submitted with this consultation letter for review and comment by the LA SHPO.**

Summary Table for Cultural Resources Investigations
Conducted within the Louisiana APEs

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
	• Transmission Line to connect with the existing 230 kV transmission line. Route includes one alternative that would take place within currently developed ROWs on the east side of the Plant access road or on the west side of adjacent industrial property occupied by LA Pigment.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). **Action: Report submitted with this consultation letter for review and comment by the LA SHPO.**
	• Methanol and Sulfuric Acid Pipelines to Storage. These pipelines would transport products to the LCC Gasification Project offsite storage area. This work would take place within currently developed ROWs.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). **Action: Report submitted with this consultation letter for review and comment by the LA SHPO.**
	• Construction Laydown Area for staging of construction equipment. This site would be located near LCC Gasification Project on property to be leased from the Port of Lake Charles. The site would be prepared for storage of construction equipment prior to use by Leucadia.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). **Action: Report submitted with this consultation letter for review and comment by the LA SHPO.**

Summary Table for Cultural Resources Investigations
Conducted within the Louisiana APEs

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
	• Methanol and Sulfuric Acid Storage Area and Pipelines to Port of Lake Charles. The area will contain above ground storage tanks for methanol and sulfuric acid. The pipelines move product from the storage area to offload by barge, ship, truck, and rail on the Port of Lake Charles property. The storage area and pipelines will be on property owned by the Port of Lake Charles.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). **Action: Report submitted with this consultation letter for review and comment by the LA SHPO.**

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Enclosure 4

Previous Correspondence with the
Louisiana State Historic Preservation Office for the
Lake Charles Clean Energy Gasification Project (formerly Lake Charles Cogeneration)

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Lake Charles Cogeneration LLC
1330 Post Oak Boulevard
Suite 1600
Houston, TX 77056

September 8, 2008

Ms. Pam Breaux
State Historic Preservation Officer
State of Louisiana
Office of Cultural Development
P.O. Box 94361
Baton Rouge, LA 70802

Re: Air Permit Application: Lake Charles Gasification Facility
Lake Charles Cogeneration, LLC
Lake Charles, Louisiana

Dear Ms. Breaux:

The Lake Charles Cogeneration, LLC (LCC) is preparing an air permit application for the proposed Lake Charles Gasification Facility to be located on property owned by the Port of Lake Charles, in Lake Charles, Louisiana. The LCC property to be developed is adjacent to and west of the existing Port of Lake Charles facilities as shown on the attached.

The LCC requests the following confirmation:

- There are no known archeological sites or historical structures either listed on or eligible for listing on the National Register of Historic Places within 1000 feet of the nearest LCC property boundary.

Should you have any questions, please contact Larry Leib at our office (713) 963-4637 or via e-mail at lrllal@sbcglobal.net. Thank you for your assistance.

Very truly yours,

Donald W. Maley, Jr.
Vice President

cc: Doug Barba
Larry Leib

Enclosures

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MITCHELL J. LANDRIEU
LIEUTENANT GOVERNOR

State of Louisiana
OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT
DIVISION OF ARCHAEOLOGY

PAM BREAUX
SECRETARY

SCOTT HUTCHESON
ASSISTANT SECRETARY

October 28, 2008

Mr. Donald W. Maley, Jr.
Vice President
Lake Charles Cogeneration, LLC
1330 Post Oak Boulevard, Suite 1600
Houston, TX 77056

Re: Air Permit Application: Lake Charles Gasification Facility
Lake Charles Cogeneration, LLC
Calcasieu Parish, Louisiana

Dear Mr. Maley:

This is in response to your letter dated September 8, 2008, concerning the above-referenced project. There is one known archaeological site located with the Port property boundaries, 16CU29, the Citgo Shell Mound; therefore, our office is requesting that a Phase I survey be conducted. I have enclosed a copy of our contracting archaeologists list for your use.

If you have any questions concerning our comments, please do not hesitate to contact Rachel Watson in the Division of Archaeology at (225) 342-8170.

Sincerely,

Scott Hutcheson
State Historic Preservation Officer

SH:RW:kc

enclosure

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CONTRACTING ARCHAEOLOGISTS

Updated: October 14, 2008

The State of Louisiana does not license, register, or otherwise approve professional archaeologists.

The Department of Culture, Recreation and Tourism has found that a listing of archaeologists active in Louisiana is often a useful guide for those contracting agencies requiring the services of an archaeological consultant. The appearance of names of individuals and firms on the following list in no way implies recommendation or endorsement by the State of Louisiana. There are other competent, qualified archaeologists living both in-state and out-of-state. This list is furnished as a state service only upon request.

Contracting agencies are advised to contact several archaeological consultants, as price and availability for work vary greatly.

AR Consultants, Inc.
S. Alan Skinner, PhD
11020 Audelia Road, Suite C 105
Dallas, TX 75243
Office: (214) 369- 0478
Fax: (214) 221- 1519
Cell: (214) 906-8021
arcdigs@aol.com

ArcCom
Archaeological Compliance Consultant
Thomas I. McIntosh, RPA
4202 Mandell Street
Houston, TX 77006
Phone (505) 982-2341
jeraii@aol.com

Archaeo-Geophysical Associates, LLC
Mr. Chester P. Walker, M.A.,RPA
8316 Hanbridge Lane
Austin, TX 78736
Phone: (512) 535-0976
chetwalker@aga-llc.net
http://www.aga-llc.net

Archeological and Environmental Consultants, LLC
Dr. Timothy K. Perttula
10101 Woodhaven Drive
Austin, TX 78753-4346
Phone: (512) 873-8131
Fax: (512) 873-8131
tkp4747@aol.com

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Mr. William B. Barr
2636 Highway 394
DeRidder, LA 70634
Phone/Fax (888) 532-0392
bbbarch1@aol.com

BIO-WEST, Inc.*
Jeffrey M. Enright
Maritime Archaeologist
Office: (512) 990-3954
Cell: (512) 801-5683

Bluestone Research, LLC
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162 Point Anne Dr.
Hartfield, VA 23071
Phone (804) 545-3151
allan@bluestoneresearch.com
www.bluestoneresearch.com

Brazos Valley Research Associates
William E. Moore, RPA
813 Beck Street
Bryan, TX 77803
Phone (979) 823-1148
bvracrm@suddenlink.net

Brockington Cultural Resources Consulting
Thomas G. Whitley
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Norcross, Georgia 30071
Phone (770) 662-5807
Fax (770) 662-5824
tomwhitley@brockington.org

C & C Technologies, Inc*
Mr. Robert Church or
Mr. Daniel J. Warren
730 E. Kaliste Saloom Road
Lafayette, LA 70508
Phone (337) 261-0660
Fax (337) 261-0192

Carved Trowel Archaeology, Ltd.
Dr. Jon Gibson
355 Coleman Loop
Homer, LA 71040
Phone (318) 927-4915
jgibson@bayou.com

Coastal Environments, Inc.*
Dr. David Kelley or
Mr. Richard Weinstein
1260 Main Street
Baton Rouge, LA 70802
Phone (225) 383-7455
Fax (225) 383-7925
dkelley@coastalenv.com
rweinstein@coastalenv.com

CRC, International Archaeology & Ecology, LLC*
Mr. Robert P. d'Aigle, RPA
555 FM 646, Suite 428
Dickinson, TX 77539
Phone (832) 592-9549
Fax (832) 225-1409
www.culturalresource.com
postoffice@culturalresource.com

Cultural Resource Analysts, Inc.
Andrew V. Martin, RPA
Steve D. Creasman, RPA
151 Walton Avenue
Lexington, KY 40508
Phone (859) 252-4737
www.crai-ky.com

Deep East Texas Archaeological Consultants
Victor J. Galan
4215 Red Oak
Nacogdoches, TX 75965
Phone (936) 560-4670

Earth Search, Inc.*
Dr. Jill-Karen Yakubik
P.O. Box 770336
New Orleans, LA 70177-0336
Phone (504) 947-0737
Fax (504) 947-1714
jill@earth-search.com

Earth Services & Equipment, Inc.
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jhokanson@e2m.net
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(859) 746-1788

GAI Consultants, Inc.
Mr. Benjamin Resnick
385 East Waterfront Drive
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Geo-Marine. Inc.
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Great Rivers Archaeological Services
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Gulf South Research Corporation
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Mr. Carl Welch
P.O. Box 83564
Baton Rouge, LA 70884-3564
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ckuttruff@bellsouth.net

New South Associates
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Natalie Adams
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Dr. Tommy Hailey
Natchitoches, LA 71497
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panamconsultants.com

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Precision Cartographics
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Dr. C. Wade Meade
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Dr. Prentice M. Thomas, Jr.
Ms. Jan Campbell
Ms. Carrie Williams-Bourgeois
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Fort Walton Beach, FL 32549
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Fax (850) 664-7835
jcampbell@pta-crm.com

R. Christopher Goodwin & Associates, Inc.*
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Dr. R. Christopher Goodwin
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* Capable of Underwater Archaeological Investigations

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URS

June 15, 2009

Mr. Donald W. Maley
Vice-President
Lake Charles Cogeneration, LLC
1330 Post Oak Boulevard
Suite 1600
Houston, TX 77056

Re: Field Assessment of Archaeological Site 16CU29, Lake Charles Gasification Facility, Lake Charles Cogeneration, LLC, Westlake, Calcasieu Parish, Louisiana.

Dear Mr. Maley:

URS was retained to conduct a Phase I cultural resources survey within the immediate vicinity of archaeological Site 16CU29, identified previously by Earth Search, Inc. in 2001. Smith et al. (2001:26, 36) indicated that intact portions of the *Rangia* shell midden associated with Site 16CU29 potentially extended from the southeast corner of the Citgo Petroleum Corporation property into the southwest corner of the proposed Lake Charles Gasification Facility, Lake Charles Cogeneration, LLC, Westlake, Calcasieu Parish, Louisiana (Figure 1).

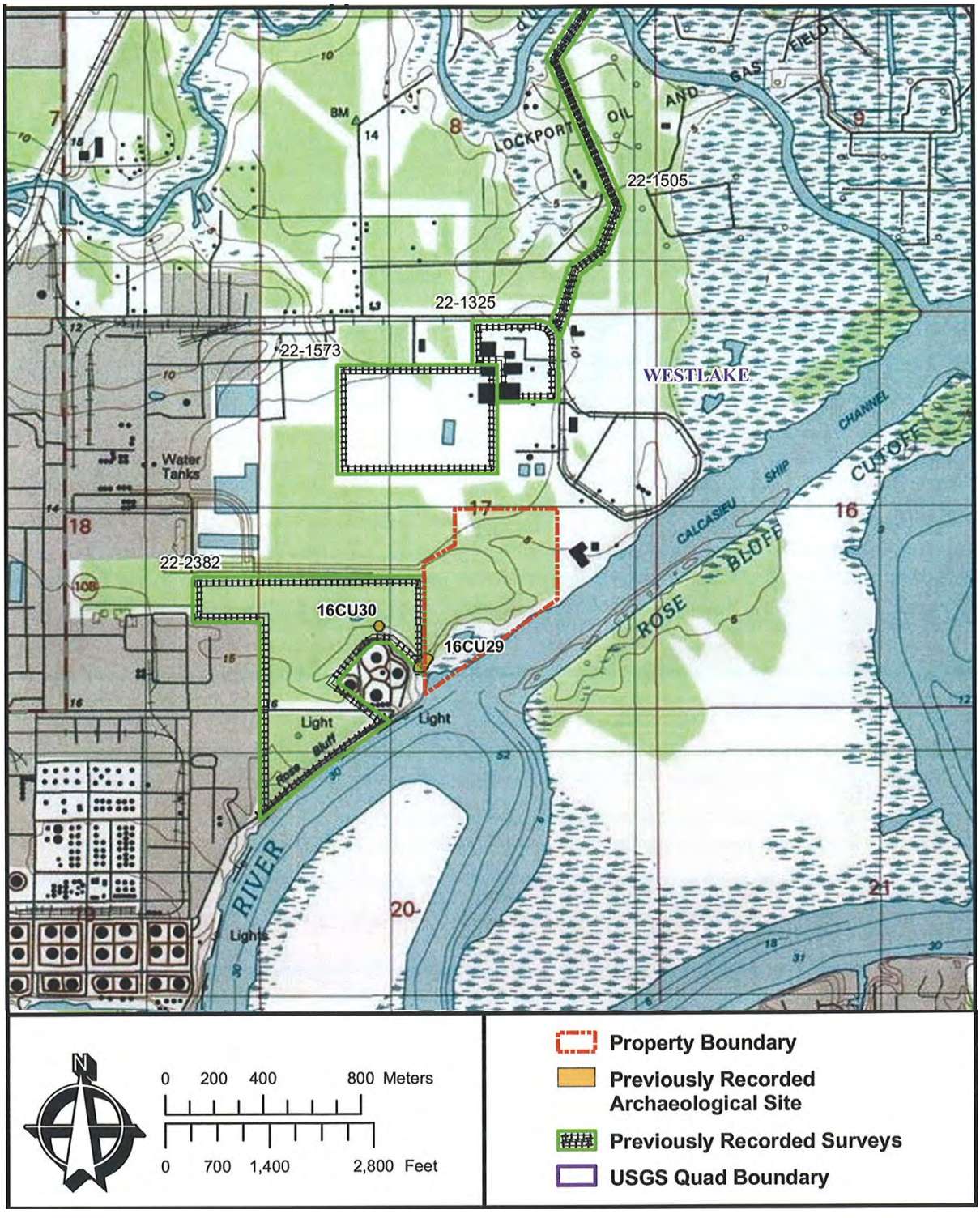
That portion of Site 16CU29 located on the Citgo Petroleum Corporation property was considered not eligible for listing on the National Register of Historic Places (NRHP). Smith et al. (2001), however, indicated that the eastern portion of the site might contain intact archaeological deposits that could potentially be considered eligible for listing in the NRHP. The purpose of this current Phase I cultural resources survey was therefore to ascertain whether intact archaeological deposits associated with Site 16CU29 extended onto the Lake Charles Gasification Facility property and, if they did, whether those cultural deposits would be considered eligible for listing in the NRHP. The cultural resources survey was conducted between June 8 and 9, 2009. Mr. Martin Handly (M.A., R.P.A.) served as Principal Investigator for this project. Mr. Hilary Dafoe (B.A.) was the Crew Chief assigned to this project; Ms. Mary Sandell (B.A.) aided him in the field effort. Ms. Lauren Bair (B.A.) conducted the laboratory analysis of the recovered prehistoric ceramics and Mr. Shane Poche (B.A.) prepared the graphics that appear within this letter.

Landform and Soil

The lower reaches of the Calcasieu River near the project area appear to have stabilized approximately 2,500 to 3,500 years ago (Roy and Midkiff 1988:98-99). Prior to the excavation of the Calcasieu Ship Channel in the 1920s through Rose Bluff, it appears that Site 16CU29 would have been located on the west (descending) bank of the Calcasieu River. The site area is characterized by the Mowata-Vidrine silt loam soils which are level, poorly drained sediments positioned on broad flats along the Gulf Coast Prairie in Calcasieu Parish (Roy and Midkiff 1988:38-40). The Mowata soils are associated with the broad flats adjacent to the Calcasieu River. The Vidrine soils occur on small convex ('pimple') mounds, rising approximately 1 to 2 m (3.3 to 6.6 ft) above the flats; these generally circular mounds can extend anywhere from 15.2 to 45.7 m (50 to 150 ft) across. Site 16CU29 appears to be positioned on top of a slightly elevated 'pimple mound' that is located in the southwest corner of the proposed Lake Charles Gasification Facility property. This area also appears to have been heavily impacted by storm surge associated with Hurricanes Rita (2005) and Ike (2008), as represented by the significant amount of debris that was deposited in the project area.

URS Corporation
7389 Florida Blvd., Suite 300
Baton Rouge, LA 70806
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Figure 1. Location of Lake Charles Gasification Facility, Lake Charles Cogeneration, LLC, Westlake, Calcasieu Parish, Louisiana. Note locations of Sites 16CU29 and 16CU30.



Cultural Resources Background

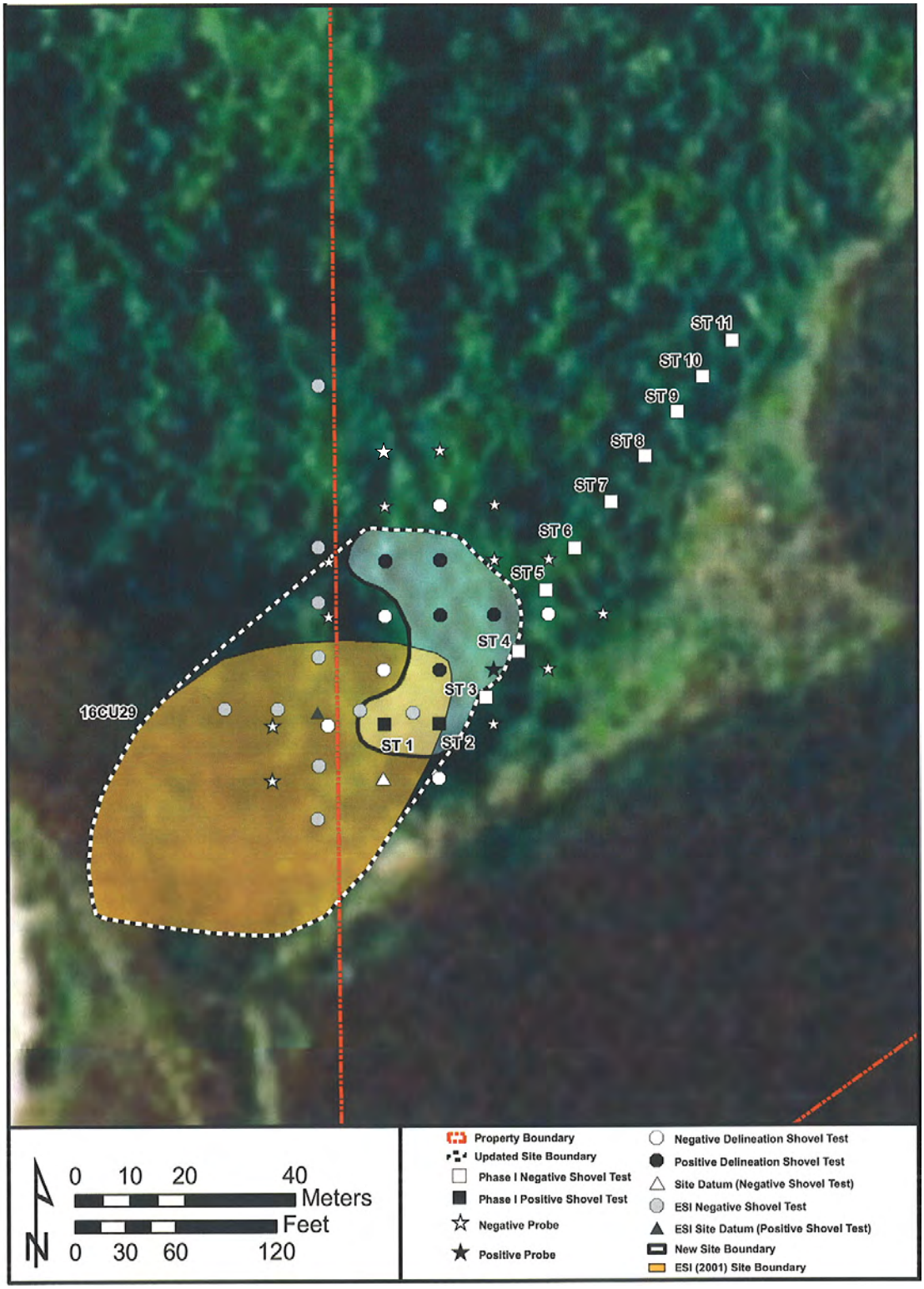
Four cultural resources surveys have been completed within 0.5 mi (0.8 km) of Site 16CU29 (Table 1). Three of these surveys were associated with industrial developments along the west (descending) bank of the Calcasieu River, while the final survey was completed for a chlorine pipeline corridor. Over 110 hectares (270 acres) of land was systematically surveyed for these four cultural resources surveys and two (2) archaeological sites were identified (Smith et al. 2001; see below).

Table 1: Previously Completed Cultural Resources Surveys located within 0.5 mi (0.8 km).

Report Number	Title (Author)	Results
22-1325	*Cultural Resource Survey of the Proposed NL Chemicals Property, Calcasieu Parish, Lake Charles, Louisiana, WSNCo Project No. 87255* (Frank 1988)	A Phase I cultural resources survey was conducted for the proposed 40-acre NL Chemicals Property. The project area lies on the west ascending bank of the Calcasieu Ship Channel. The survey consisted of pedestrian survey and judgmental shovel-testing program on several 'pimple' mounds located in the project area. No cultural materials were recovered.
22-1505	*Level II Cultural Resources Survey of a Proposed Chlorine Pipeline, Calcasieu Parish, Louisiana* (Shuman 1990)	A Phase I cultural resources survey was conducted for a 3-mile long 6-inch diameter chlorine pipeline. No further additional cultural resources studies were recommended, but monitoring was advised for any locations that required deep drilling.
22-1573	*Cultural Resource Survey of the Proposed Kronos Louisiana, INC. Calcasieu Parish, Louisiana, WSNCo Project No. 91183* (Frank 1991)	A Phase I cultural resources survey was conducted for the proposed 110-acre Kronos Louisiana Property. The project area lies on the west ascending bank of the Calcasieu Ship Channel. The survey consisted of pedestrian survey and judgmental shovel testing on 'pimple' mounds encountered in the project area. Monitoring was recommended, but no cultural materials were recovered.
22-2382	*Intensive Cultural Resources Survey Citgo Petroleum Corporation, Lake Charles Refinery, Calcasieu Parish, Louisiana* (Smith et al. 2001)	A Phase I cultural resources survey was conducted for the proposed 120-acre CITGO oil refinery. The project area lies directly west of the Calcasieu River, and at the southern extent of the Calcasieu Shipping Channel. Based on the results of the survey and site delineation, both Sites 16CU29 and 16CU30 were recommended for avoidance and additional testing of Site 16CU29 was recommended for the portions that extended to the east (outside) of their project area.

Site 16CU29, initially measured 70 by 55 m (230 by 180 ft) in extent, was identified in the southeast corner of the Citgo Petroleum Corporation property, but appeared to extend into the southwest corner of the proposed Lake Charles Gasification Facility project area (Figures 1 and 2; Smith et al. 2001:26-33). The site was initially identified by an extensive *Rangia* shell midden located near the toe of a low ridge that terminated near the bank of the Calcasieu Ship Channel. The shell midden was clearly represented along the shoreline and ranged between 20 and 30 cm (8 and 12 in) in thickness; the *Rangia* shell also appeared to be wave-washed and redeposited (Smith et al. 2001:28, 36). Eleven shovel tests were placed on the slope above the exposed bankline that displayed the intact shell midden. Of this number, only one shovel test contained cultural material, consisting of a single ceramic sherd of Baytown Plain*, var. unspecified* (Phillips 1970), dated from ca. 100 B.C. to A.D. 700. Based on the presence of the exposed shell midden along the Calcasieu Ship Channel bankline, it was suggested by Smith et al. (2001:36) that intact cultural materials might be represented to the east of the Citgo Petroleum Corporation property; however, the portion of Site 16CU29 located within the Citgo property was considered not eligible for listing in the NRHP.

Figure 2. Map of Site 16CU29 identifying 2001 and 2009 investigations.



Historic Site 16CU30 was also identified on the Citgo Petroleum Corporation property, approximately 240 m (787 ft) to the northwest of Site 16CU29 (Figure 1). The site measured 15 by 40 m (49 by 131 ft) in extent and was comprised of the remnants of a double fireplace surrounded by chimney rubble (Smith et al. 2001:26-33). Within the chimney rubble, ironstone and whiteware ceramic sherds, glass shards, square and wire nails, and animal bone were recovered; in addition, two of the 14 shovel tests contained pearlware and ironstone ceramic sherds and glass shards. The manufacturing dates associated with these items indicated that the site was associated with an occupation from the early nineteenth century through to the early twentieth century; the recoveries suggested to Smith et al. (2001) that the site represented a historic residential structure. The site was considered eligible for listing in the NRHP based on the limited information associated with historic period homesteads along the Calcasieu River (Smith et al. 2001:36).

Field Investigation Methods

Visual inspection of the Calcasieu Ship Channel bankline was implemented during boat access to the site area; however, no evidence of the *Rangia* shell midden was noted during this visual inspection. Water levels were fairly high at the time of the site visit, however. Pedestrian survey transects were attempted within the site area upon landing, but the thickness of the vegetation precluded a systematic inspection of the ground surface at Site 16CU29 (Figure 3). During the delineation shovel testing effort (discussed below), evidence of *Rangia* shell was noted on the ground surface near several of the shovel tests locations (Figure 4).

A site datum was established near the GPS point used by Smith et al. (2001) as their datum for Site 16CU29 (Figure 2). Shovel tests within the previously identified site area were oriented in a cruciform pattern and they were excavated until two (2) negative shovel tests and/or soil probes were encountered. This process served to delimit the horizontal boundaries of the site. When cultural materials were encountered, then the base of the shovel test excavation was extended to at least 20 cm (8 in) beneath the last occurrence of cultural materials; this functioned to define the vertical boundaries of the site. To ensure that any potential cultural materials located to the east of the known site area were identified, a single shovel test transect was also placed 20 m (66 ft) to the northwest of the Calcasieu Ship Channel, parallel to the bankline; these shovel tests were spaced 10 m (32.8 ft) apart.

Shovel tests displayed an average excavated diameter of 30 cm (12 in) and they were excavated to between 50 and 60 cm (20 and 24 in) below surface (bs) to sterile subsoil, unless water was encountered. All shovel tests were excavated according to their natural or cultural stratigraphy and all excavated soils were screened through ¼-inch mesh. Hand-sorting and visual examination was used when extremely wet or compact clayey soils were encountered. Typical Munsell soil charts were used to describe soil color and standard soils nomenclatures were used in the description of the excavated sediments associated with each shovel test. All of the excavated shovel tests were backfilled immediately upon completion of the excavation. In addition, soil probes were also utilized to determine the presence or absence of *Rangia* shell beyond the boundaries of the shovel testing effort; these probes were also spaced at 10 m (33 ft) intervals. A total of 22 shovel tests and 14 probes were excavated during the systematic assessment of Site 16CU29.

An Xplore Tablet PC in conjunction with a Trimble Pro-XT antenna with sub-meter accuracy was used by URS to record the beginning and endpoint of shovel test transects (i.e., BOT and EOT) and selected shovel test locations. Shovel test information was collected on standardized survey forms, with digital photographs taken of all survey areas to document current conditions. A detailed pace-and-compass site map for all encountered cultural resources was also produced.

Figure 3. Overview of Site 16CU29 near the Calcasieu River shoreline, facing west. Note tank farm in background.



Figure 4. Close-up of surface scatter of *Rangia* shell, Site 16CU29, Shovel Test 1030N, 1010E.



Cultural Resources Survey Results

At the time of the field inspection, the landform containing Site 16CU29 was covered with regenerating forest and a thick understory; evidence of storm surge was represented by redeposited debris throughout the project area. Twelve shovel tests and 14 soil probes were placed on the 10 m (33 ft) delineation grid to define the boundaries of the previously recorded site within the Lake Charles Gasification Project area. A typical shovel test encountered in the site area displayed three strata in profile. Stratum I extended to 10 cmbs (4 inbs) and it was described as a dark gray (10YR 4/1) silty loam. Beneath this was Stratum II, a 10 cmbs (4 inbs) thick deposit of dark brown (10YR 3/3) silty loam. Where represented in the site area, the lens of variably thick *Rangia* shell would have been located beneath Stratum II and above Stratum III. Stratum III contained a reddish brown (5YR 4/3) clay mottled with a yellow (2.5Y 8/6) silty clay that terminated between 20 and 24 inbs (50 and 60 cmbs).

Six of the seven shovel tests and a single soil probe encountered a variably thick (10 to 40 cm [4 to 16 in]) lens of *Rangia* shell. The last shovel test (1030N, 1010E) recovered two small, fragmentary ceramic sherds of Baytown Plain*, var. unspecified* (Phillips 1970) within the center of the shell midden. These sherds were recovered from between 15 and 35 cmbs (6 and 14 inbs). This delineation shovel test is located approximately 30 m (99 ft) to the northeast of the 2001 shovel test that contained a comparable ceramic sherd of Baytown Plain*, var. unspecified*. The current shell midden deposit appears roughly kidney-shaped and it is positioned to the northeast of the previously defined boundary of Site 16CU29. The site area within the Lake Charles Gasification Project area appears to measure 30 by 40 m (99 by 131 ft) in extent. When combined with the previously defined boundary described by Smith et al. (2001), Site 16CU29 appears to be aligned along a northeast-southwest axis and measures 45 by 95 m (148 by 312 ft) in extent, representing 0.43 hectares (1.1 acres).

To ensure that no additional cultural materials were located to the east of the recently defined boundaries of Site 16CU29, a single shovel test transect was oriented northeast-southwest, paralleling the Calcasieu Ship Channel and the approximate axis of the known site. Eleven shovel tests were spaced at 10 m (33 ft) intervals along this transect. Of this number, only the two that fell within the boundaries of Site 16CU29 displayed a *Rangia* shell lens; no further cultural materials were encountered along this northeastern transect.

Management Recommendations

Smith et al. (2001) suggested that intact cultural materials might be located to the east of the Citgo Petroleum Corporation property associated with Site 16CU29. They recommended that "(a)dditional testing should be undertaken to determine the NRHP status of the indeterminate portion of 16CU29 that extends outside of the APE (Area of Potential Effects)" (Smith et al. 2001:36).

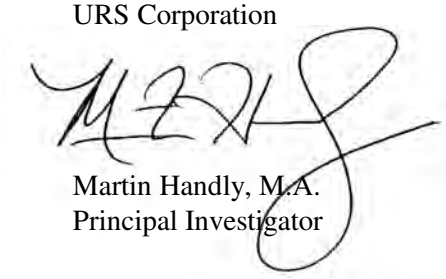
The current Phase I cultural resources survey was successful in relocating Site 16CU29; however, the integrity of the site appears to have changed since the 2001 investigations. A shovel test placed immediately adjacent to the 2001 shovel test containing the single prehistoric ceramic sherd failed to locate any *Rangia* shell and/or cultural materials. In addition, ST1 and ST2 (Figure 2), associated with the northeast-southwest transect, were positive for *Rangia* shell deposits; these two shovel tests were located immediately adjacent to two shovel tests that were negative for shell in 2001. Finally, the extensive shell midden that was noted in the southeast corner of the Citgo Petroleum Corporation property was not observed during the current field investigation. Given the above, it would appear that the shell midden noted in 2001 has been eroded and/or redeposited from that portion of Site 16CU29 (possibly as a result of hurricane storm surges over the last four years).

Although shell midden deposits are present in the center of the newly defined extent of Site 16CU29, the intensive subsurface testing program initiated during the site delineation process suggests that the site has been disturbed and displays very low artifact densities. This would indicate that Site 16CU29 lacks depositional integrity and has limited research value. URS recommends that Site 16CU29 does not possess those qualities of significance as identified by the National Register Criteria for Evaluation (36 CFR 60.4 [a-d]). The site should not be considered eligible for listing in the NRHP and no additional assessment of this site is warranted.

If you have any questions or concerns with the above recommendations, please do not hesitate to contact me at (225) 276-4826.

Sincerely,

URS Corporation



Martin Handly, M.A.
Principal Investigator

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MITCHELL J. LANDRIEU
LIEUTENANT GOVERNOR

State of Louisiana
OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT

PAM BREAUX
SECRETARY

SCOTT HUTCHESON
ASSISTANT SECRETARY

June 26, 2009

Mr. Niels Larsen
LA Department of Environmental Quality
Permits Application Administrative Review Group
Permit Support Services Division
Office of Environmental Services
P.O. Box 4313
Baton Rouge, LA 70821-4313

Re: Lake Charles Gasification Facility
Lake Charles Cogeneration LLC
Agency Interest No. 160213
Activity No. PER20090001
Lake Charles, Calcasieu Parish, LA

Dear Mr. Larsen:

Reference is made to our letter dated March 9, 2009 (copy enclosed), in which we informed your agency that a Phase I survey had been requested of the proposed Lake Charles Gasification Facility, due to the presence of a recorded archaeological site (16CM29) within the project boundaries. We asked that issuance of the LPDES permit be withheld pending review of the survey results by the State Historic Preservation Office.

Please be advised that we are in receipt of documentation dated June 9, 2009, concerning the archaeological site assessment made of site 16CU29 by URS (copy enclosed). Field investigations resulted in the delineation of expanded boundaries for this site and the assessment that the site was not eligible for listing on the National Register of Historic Places due to a lack of depositional integrity and limited research potential. As we concur with this assessment, addition investigations are not warranted. Consequently, we have no objection to issuance of the LPDES permit.

Should you have any questions concerning our comments, do not hesitate to contact Duke Rivet in the Division of Archaeology at (225) 219-4598 or be e-mail at drivet@crt.state.la.us.

Sincerely,

Scott Hutcheson
State Historic Preservation Officer

SH:DR:s

Enclosures: as stated

c: Mr. Martin Handly
URS Corporation
7389 Florida Blvd., Suite 300
Baton Rouge, LA 70806

DRAFT REPORT

November 21, 2011

A Phase I Cultural Resources Survey of the Proposed Lake Charles Pipeline Lateral Project Located near Sulphur, Calcasieu Parish, Louisiana

OAR PROJECT NUMBER: 11-144
CH2M HILL PROJECT: 413754.01.SV.CU
CH2M HILL PURCHASE ORDER NO. 941464

PERFORMED FOR: CH2M HILL
1000 Abernathy Road, Suite 1600
Atlanta, Georgia 30328
Attn: Mr. Jason Wallace

PERFORMED BY: Joel H. Watkins, Cultural Resources Analyst
John F. Lieb, Cultural Resources Assistant
Daryll R. Berryman, Cultural Resources Assistant
Donald L. Brown, Cultural Resources Assistant
The University of Alabama
Office of Archaeological Research
13075 Moundville Archaeological Park
Moundville, Alabama 35474

DATE PERFORMED: April 18-22, May 10-13, June 8-10,
August 31-September 2, 2011

Joel H. Watkins
Cultural Resources Analyst
Office of Archaeological Research

Eugene M. Futato RPA/Deputy Director
The University of Alabama
Office of Archaeological Research

DRAFT REPORT

ABSTRACT

The University of Alabama, Office of Archaeological Research recently conducted a Phase I cultural resources survey of the proposed Lake Charles Pipeline Lateral Project in Calcasieu Parish, Louisiana. The proposed pipeline project consists of a main route approximately 11 miles (17.7 km) in length, a series of five temporary work areas (TWA) ranging from one to four acres in size (.4 to 1.6 ha), and a 0.5 acre (.2 ha) meter station. Also included are eight access roads, although only three are not fully paved or gravel topped. The pipeline has a 200 ft (61 m) environmental survey width along the entire corridor except where encroached by an existing railroad right-of-way.

Background research for the pipeline project was conducted online with the Louisiana Division of Archaeology (LDOA) Archaeological Database, and at the LDOA offices, located in Baton Rouge, Louisiana. The results of the background research showed six prerecorded historic associated sites located within a general 0.5 mile radius of the project corridor, although none will be impacted as they are all well away from the project corridor. The National Register of Historic Places (NRHP) and related supplements for Louisiana list no properties or historic structures within a one mile radius of the project corridor.

The field survey was conducted during the periods April 18-22, May 10-13, June 8-10, and August 31-September 2, 2011. The survey corridor, as well as the TWAs, access roads, and meter station site were walked over and a combination of surface observation and shovel testing was utilized for testing methodology. As a result, one site, Site 16CU73, has been added to the Louisiana State Site File. Based on the sparse material recovery, absence of any structural features and undetermined historic validity of the material recovered, the site is not considered significant, and no further testing is recommended. In addition, one modern cemetery (Hardey Cemetery) was also found to be within the proposed pipeline corridor and will be avoided by using the Horizontial Directional Drill technique beneath the site to avoid any impact to the two burials present.

As a result of this project, it is recommended that the proposed pipeline, associated TWAs and access roads, be cleared from a cultural resources perspective, with the understanding the Hardey Cemetery will be directionally drilled beneath to avoid impact.

DRAFT REPORT

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DRAFT REPORT

A Phase I Cultural Resources Survey of the Proposed Lake Charles Pipeline Lateral Project Located in Calcasieu Parish, Louisiana

Joel H. Watkins

Introduction

The University of Alabama, Office of Archaeological Research (OAR) was contracted by Denbury Offshore, Inc. c/o CH2M Hill to perform a Phase I cultural resources survey for the proposed Lake Charles Lateral Pipeline Project (Appendix B). The pipeline is situated entirely within Calcasieu Parish, oriented north-south between the towns of Lake Charles to the east and Sulphur to the west. Included in the project scope of work is approximately 11 miles (17.7 km) of pipeline right-of-way (ROW), with a general environmental survey width of 200 ft (61 m), narrowing to 150 ft (48 m) along an approximately 1.2 mile (1.9 km) segment due to an existing railroad line ROW that parallels the proposed pipeline corridor along the eastern side in this area. Included in the survey is one short alternate route of less than .4 mi (.6 km) close to the Hwy 90 crossing. Also included in the survey is a proposed 0.5 acre (.2 ha) meter station site at the northern terminus of the pipeline, where it will tie-in to an existing pipeline. In addition several temporary work area/equipment storage yard sites (TWA) along the corridor were surveyed. These sites range in size from four acres to less than one acre, and include a few long, linear TWA's for pipe storage during directional drilling operations. The final aspect of the project involves a series of eight access roads leading to the proposed pipeline ROW. The total project survey area is equivalent to approximately 286 acres (115.7 ha). Joel H. Watkins (Cultural Resources Analyst/Field Director), John F. Lieb (Cultural Resources Assistant), Daryll R. Berryman (Cultural Resources Assistant) and Donald L. Brown (Cultural Resources Assistant) conducted the survey during the periods April 18-22, May 10-13, June 8-10, and August 31-September 2, 2011 to locate and identify any archaeological sites or historic standing structures with potential for impact as a result of this project. The Principal Investigator for the survey is Eugene M. Futato, RPA/Deputy Director of OAR.

The research design of the Phase I survey is to locate and identify any archaeological sites or historic standing structures within the survey boundaries, assess their significance, and provide recommendation with regard to guidelines set forth by the *National Register of Historic Places* (NRHP). Included in this report is a discussion of the environmental setting of the survey area, a literature search of any sites within or near the survey area, a description of field and laboratory methods, the results of the cultural resources reconnaissance, and conclusions and recommendations based on the findings of this survey.

Environmental Setting

The proposed pipeline route is approximately 11 mi (17.7 km) in length and has an environmental survey width of 200 ft (61 m) along a majority of the route. The origin point of the pipeline can be seen on the USGS 7.5' Westlake, Louisiana topographic quadrangle in the NW ¼ of the SE ¼ of the SE ¼ of Section 17, T10S, R9W. The pipeline will originate just north of the Calcasieu Ship Channel where an industrial plant will be built. Plans are to directionally drill beneath an existing chemical plant that sits just to the north of the origin point and emerge on the north side of the plant, north of Bayou d'Inde Road. The pipeline then bears roughly north, then northwest and finally west, primarily aligned adjacent to a series of existing transmission line, pipeline, railroad, and roadway corridors. The pipeline will terminate at a proposed 0.5 acre (.2 ha) meter station tie-in located adjacent to the north side of Bankins Road. The terminus point of the pipeline can be seen on the USGS 7.5' Buhler, LA topographic quadrangle in the SE ¼ of the NE ¼ of the NE ¼ of Section 35, T8S, R10W. Also included are a series of temporary equipment/pipe storage yards associated with the project. These sites are situated at strategic locations along the corridor and range in size from four acres (1.6 ha), to less than one acre (.4 ha) (Figures 1-5).

Of the eight access roads, five consist of either paved or gravel topped roads that extend directly to or across the proposed pipeline corridor (AR 1, 4, 5, 7, 8). These roads were surveyed, although they will receive little modification to the existing roadbed. The three remaining access roads will necessitate some modification to allow for heavy machinery/truck access to the corridor. A description of the access roads follows:

Access Road 1: AR 1 is Bayou d'Inde Road - A paved residential road that becomes a grass field leading to the proposed pipeline (Figure 1).

Access Road 2: AR 2 is an unmodified utility road that extends west from Anthony Ferry Road for approximately 2,300 ft (701 m) out to the pipeline corridor just as it turns off of the railroad ROW alignment (Figure 4).

Access Road 3: AR 3 will extend south then west from Houston River Road onto the corridor (Figure 3). The initial portion is gravel topped. The access road will extend south along this road, and then continue south for less than 100 ft (30 m) onto an east-west oriented transmission line ROW. The road will turn east and follow the northern edge of the transmission line ROW for approximately 400 ft (122 m) to terminate at the pipeline corridor.

Access Road 4: AR 4 is PPG Industries private road, a gravel-topped road that directly accesses the pipeline (Figure 2).

Access Road 5: AR 5 is Pete Manena Road, a paved public road that directly accesses the pipeline (Figure 2).

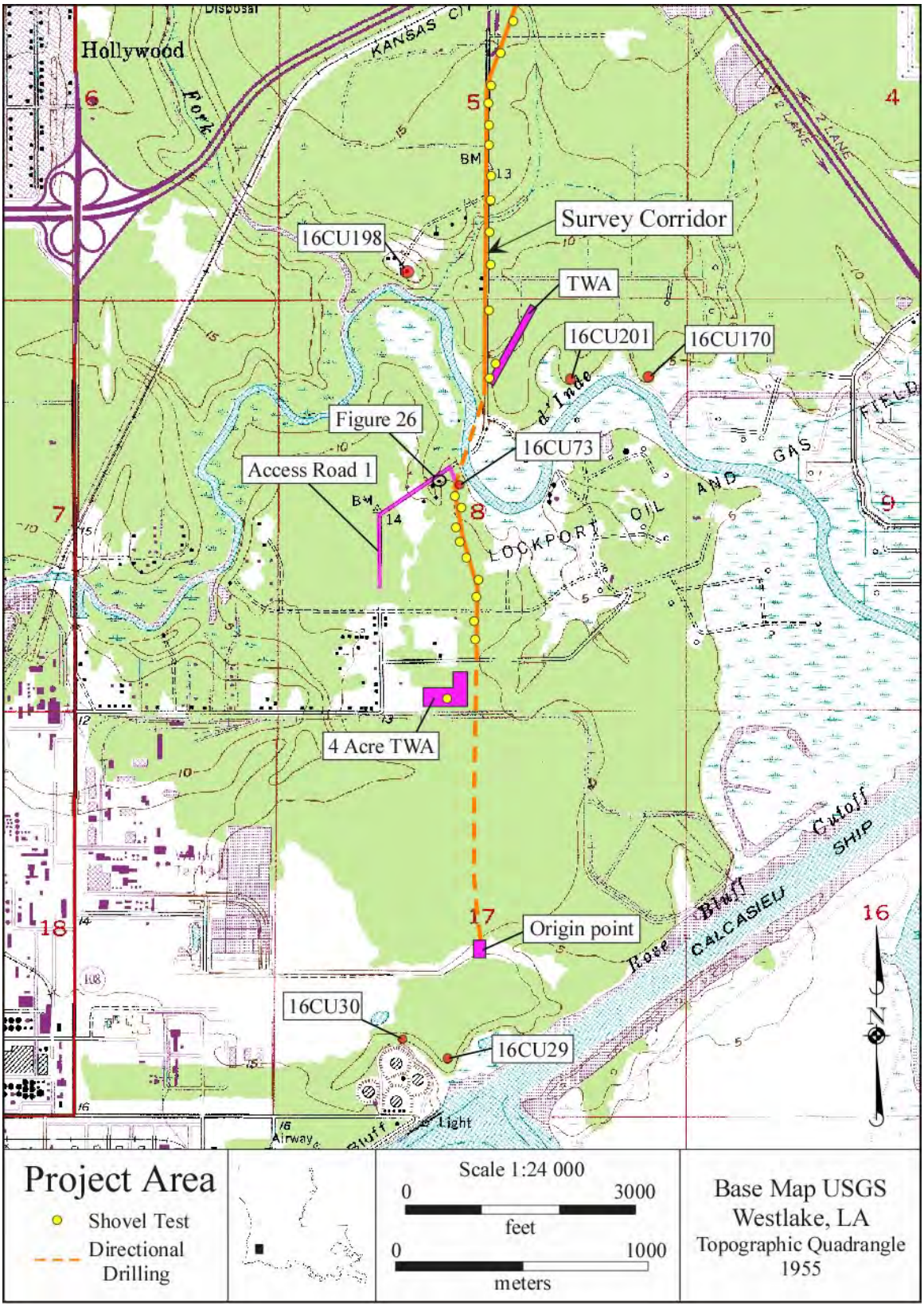


Figure 1. Topographic map showing location of project route.

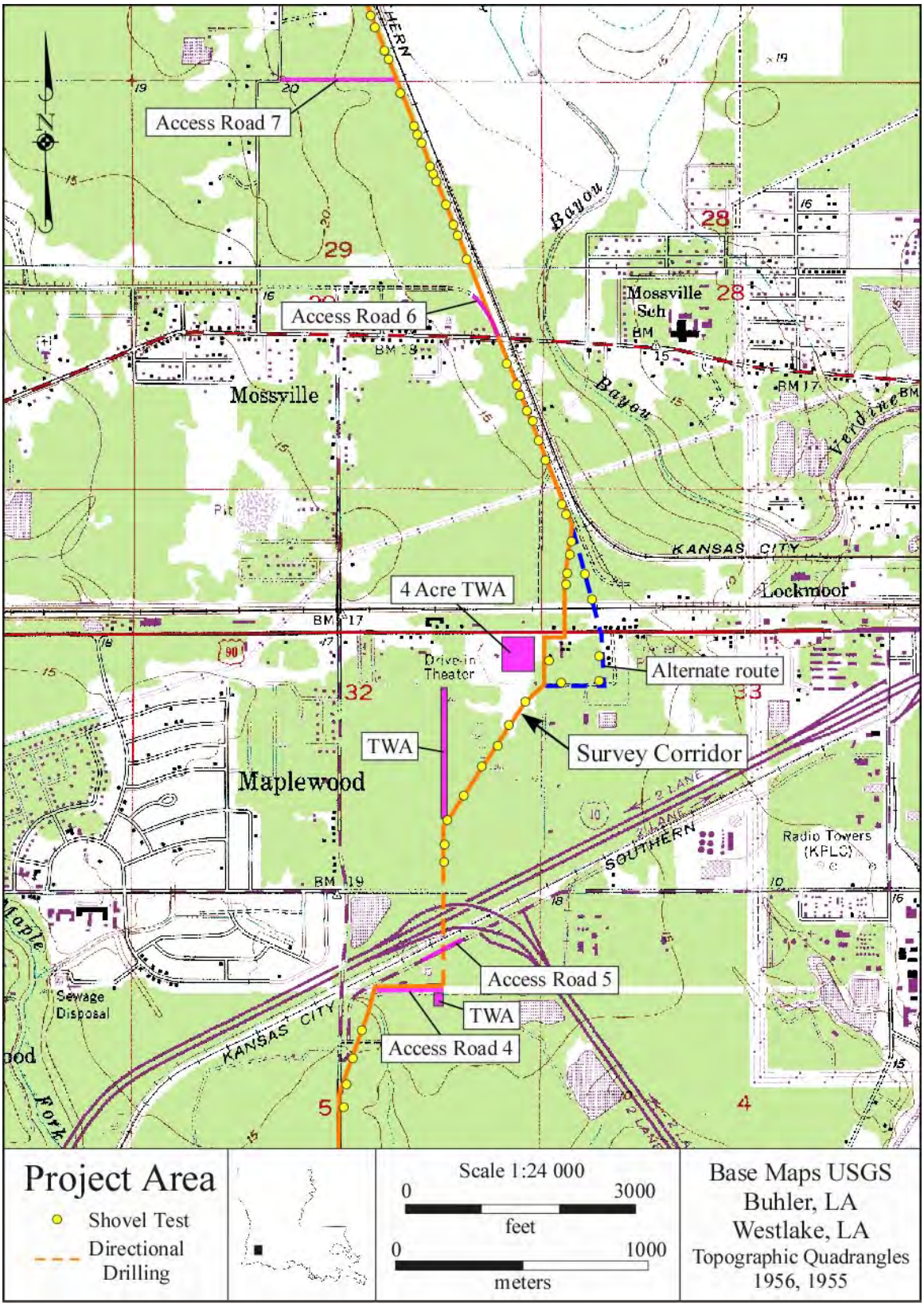


Figure 2. Topographic map showing location of project route.

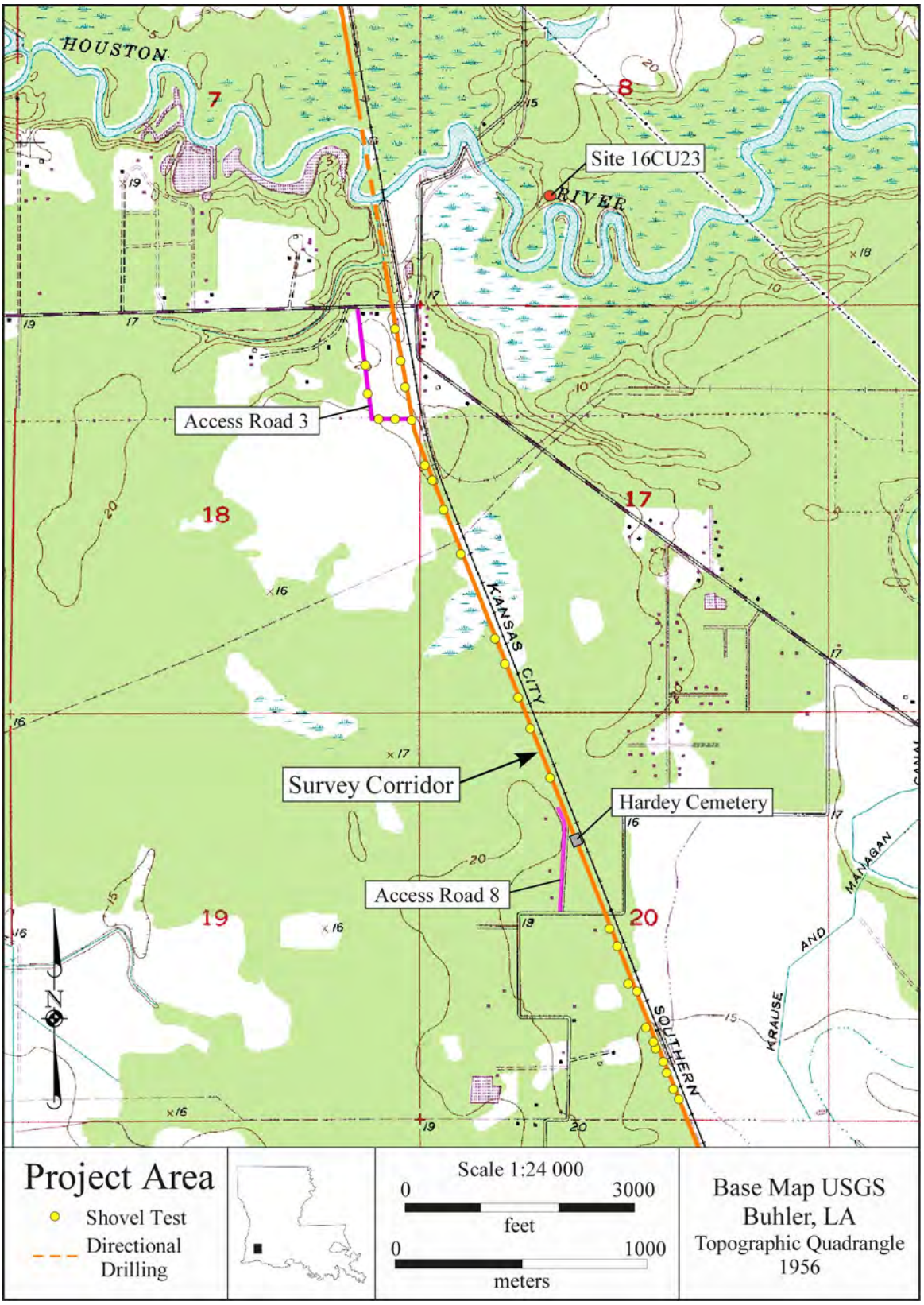


Figure 3. Topographic map showing location of project route.

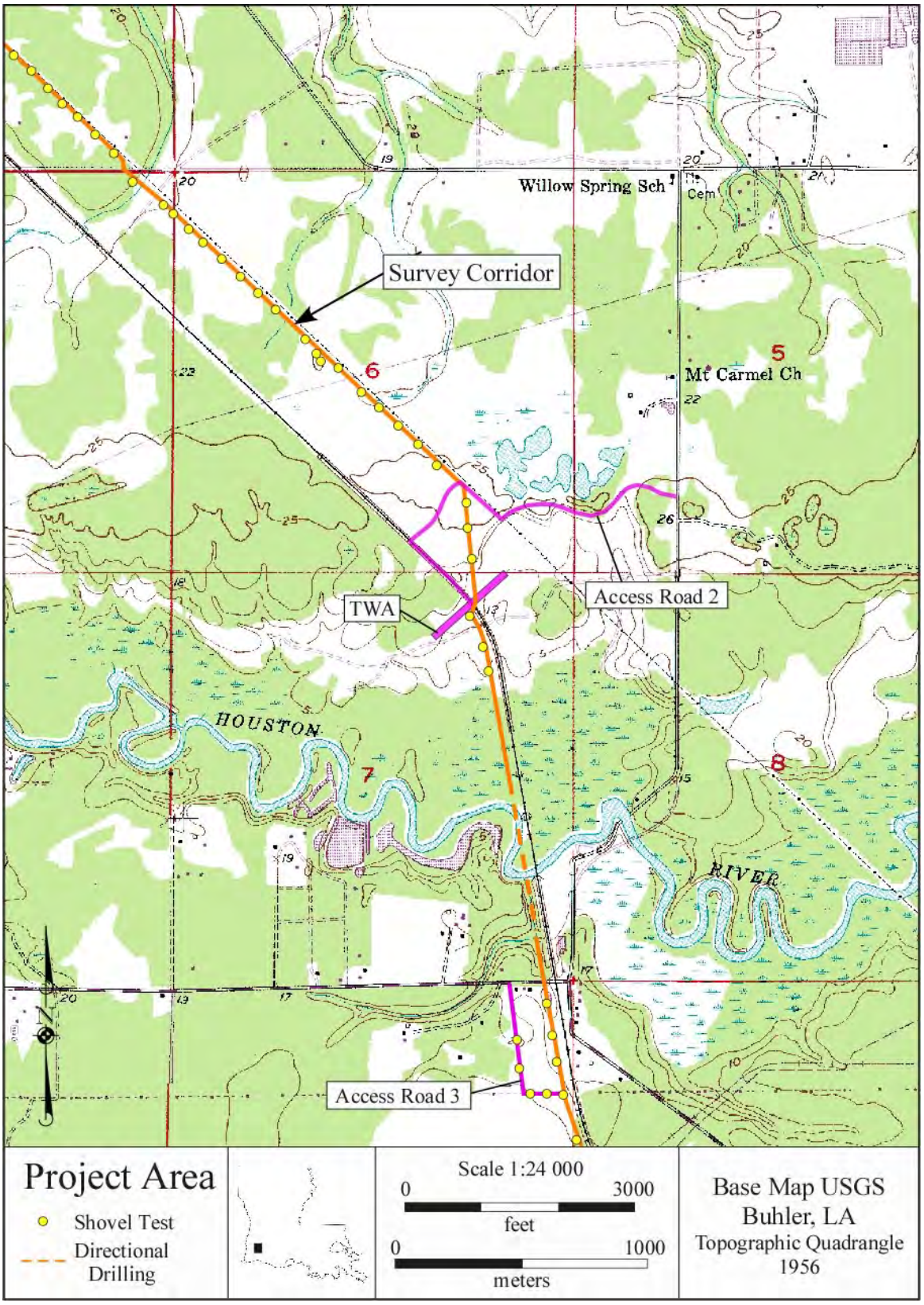


Figure 4. Topographic map showing location of project route.

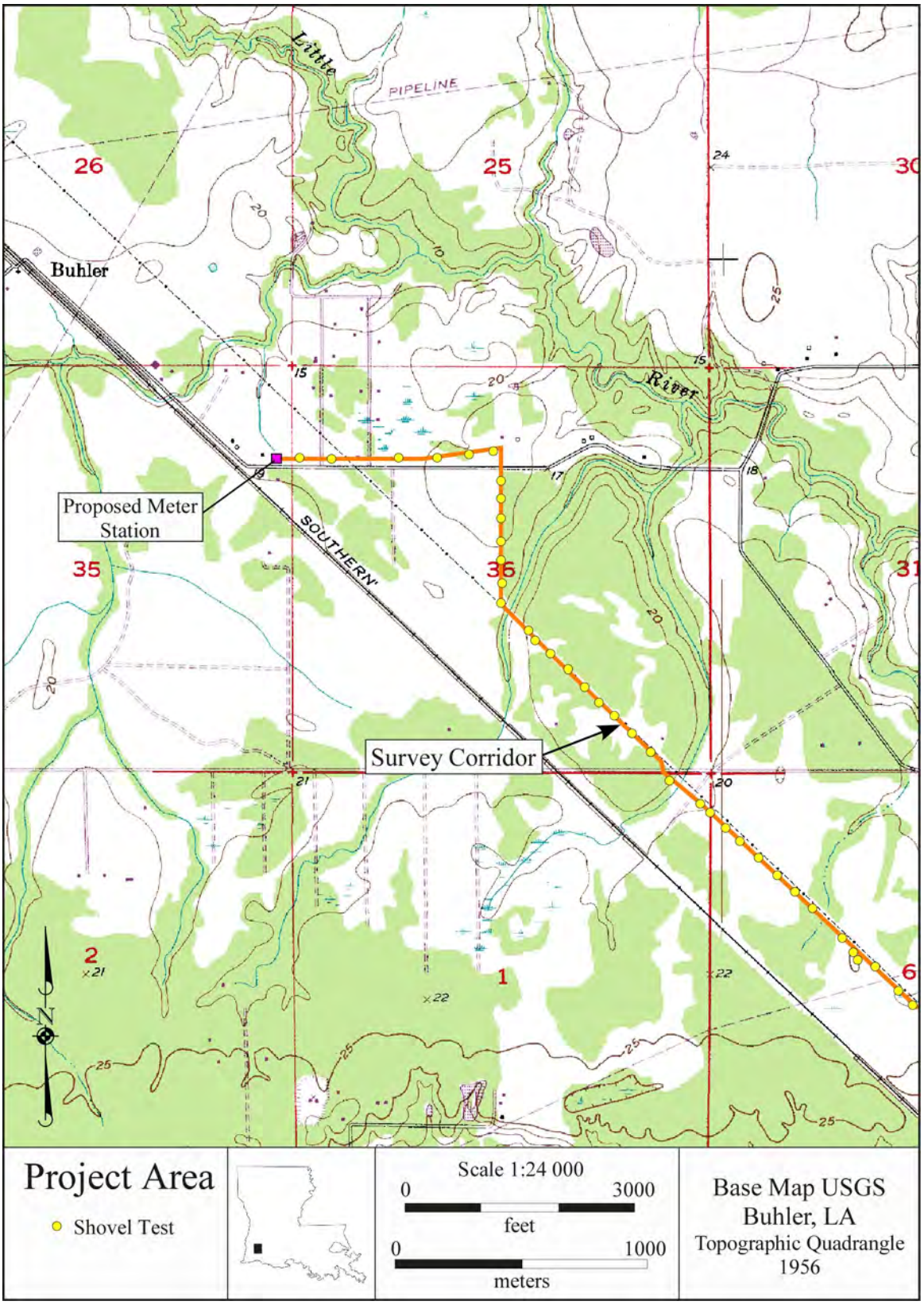


Figure 5. Topographic map showing location of project route.

Access Road 6. AR 6 extends onto the pipeline from Old Spanish Trail Road (Figure 2). AR 6 is a remnant of an old railroad corridor, now with a pipeline emplaced in it. The corridor is less than 200 ft (61 m) in length and covered with grass.

Access Road 7: AR 7 is a gravel-topped private road that will access the pipeline directly from Evergreen Road (Figure 2).

Access Road 8: AR 8 is Hardey Road, a paved residential road that will access the pipeline corridor directly (Figure 3).

The survey area is located in the Northern Humid Gulf Coastal Prairies Level IV Ecoregion of the Western Gulf Coastal Plain Level III Ecoregion (Daigle et al. 2006). The Northern Humid Gulf Coastal Prairie is described as a flat coastal plain with innumerable low circular mounds (pimple mounds) and occasional low coastal ridges and indistinct relict fluvial channels. Low-gradient rivers and streams are present, some of which are channelized. Geologically, the region is formed on Quaternary (late Pleistocene) alluvial and deltaic sand, silt, clay, and gravel. Soils typical of the region include Crowley, Kaplan, Judice, Midland, Morey, Mowata, and Vidrine. On floodplains are Basile and Brule soils (Soil Survey Staff 2008). Natural vegetation includes Prairie grassland with little bluestem, big bluestem, Indiangrass, brownseed paspalum, switchgrass, and other herbaceous species. Forested areas include riparian forests or gallery forests of bottomland hardwoods. In wetter areas such as the backswamps adjoining the Houston River are cypress-gum swamps (bald cypress, water tupelo), and on less flooded zones are pecan, water oak, live oak, and elm.

Cultural Overview

Paleo-Indian Stage 10,000 B.C. to 6,000 B.C.

This stage is not well documented in the region, due in part to changing geography, sea level rising, and shifting river courses (Jeter et al. 1989). Most Paleo-Indian artifacts have been surface collected from ridges, hills, and, occasionally, terraces or floodplain rises (Kenmotsu and Perttula 1993). The Paleo-Indians lived in small, nomadic groups with a subsistence economy based on hunting and foraging. The stage is characterized by the use of lanceolate points with or without fluting. These points range in size from two to six inches in length with a straight or incurvate base. Point types include Clovis and Folsom, followed by transitional Paleo-Indian points such as Dalton, San Patrice, and Scottsbluff (Jeter et al. 1989).

Archaic Stage 6000 B.C. to 200 B.C.

The Archaic stage is marked by a change in projectile point styles and the addition of new tool types. The stage is generally divided into Early, Middle, and Late Archaic periods. In Louisiana, some researchers refer to the Archaic stage as Meso-Indian, which includes the period

from the close of the Paleo-Indian stage to the beginnings of the Poverty Point culture (Brain 1971; Haag 1978; Neuman 1984). Regardless, the stage is typified by small nomadic groups; however, their range was becoming less extensive as they learned to more fully exploit local resources (Story et al. 1990). Innovations included the use of the atlatl for hunting and the use of fishhooks, traps, and nets for catching fish and small animals (Neuman and Hawkins 1993). In general, Archaic occupation is represented by a progression of side-notched, expanded stemmed and straight stemmed dart point types. Most Archaic sites are found primarily in the uplands and on floodplain rises (Jeter et al. 1989). Earthen mounds such as those at Poverty Point have been dated as early as this time period in Louisiana and are some of the earliest known mounds in North America (Driskell and Howard 1988). The Poverty Point culture lasted until approximately 600 B.C., when it was replaced by Tchula/Tchefuncte cultures (Webb 1968, 1970, 1982). No Poverty Point components have been identified in northwest Louisiana (Campbell et al. 1983). Poverty Point influence generally extends up the Mississippi Valley, up tributaries into the Ozarks, and into southeastern Missouri. Poverty Point is also documented in the Yazoo Basin, along the Gulf Coast of Florida, and throughout southern Mississippi (Connaway et al. 1977; Thomas and Campbell 1991).

Woodland Stage 200 B.C. to A.D. 1200

As with the Archaic, this stage is also generally divided into Early, Middle, and Late periods. Woodland is subsumed within the Neo-Indian era (Brain 1971; Neuman 1984). Distinctive phases or cultures for this stage have been identified for the Mississippi Valley generally based on ceramic assemblages or types. These include Early Woodland-Tchula/Tchefuncte, 600 B.C. to 100 B.C.; Middle Woodland-Marksville, 100 B.C. to A.D. 400; and Late Woodland-Baytown/Troysville/Deasonville/Coles Creek, A.D. 400 to A.D. 1200. While the hallmark types such as Tchefuncte, Coles Creek Incised, or Marksville Stamped occur at sites in this area, the most common types appear to be Goose Creek and San Jacinto variants (Springer 1979). In general, the sites lack the complex assemblages associated with the types of sites commonly found in the Mississippi River Valley.

Mississippian Stage A.D. 1200 to A.D. 1600

The Mississippian stage generally falls between A.D. 1200 and A.D. 1600. In the Ouachita River drainage, the Plaquemine period supplants the initial Mississippian stage further to the east, although Fuller (1985) posits the Plaquemine was rather short lived and weakly represented in this general area. This period is typified by ceramic styles similar to those of the preceding Troyville-Coles Creek period. Brushing and engraving were two new techniques used for ceramic decoration during this time. To the east, closer to the Mississippi River and eastward, began the rise of the Mississippian stage, typified by a much more varied agricultural production and construction of fortified towns, some with platform mounds used for ceremonial purposes. Also notable were well established trade networks and powerful and influential societal/tribal leadership.

Historic Period

While Mississippian culture flourished further to the east, in this area, the Plaquemine culture gradually gave way to the protohistoric Attakapa. Engaged in a well-defined seasonal procurement strategy, the Attakapa made full use of the Prairie Terrace and Chenier Plain resources. Attakapa material culture was predominantly utilitarian with an apparently strong basketry tradition. Weinstein and Gibson both postulate that Attakapa baskets were a prime trade item (Weinstein et al. 1979, Gibson 1976). The Attakapa remained in the area through about the first 150 years of Euro-American occupation. By the time of the Louisiana Purchase, however, their numbers had been greatly reduced, as the Euro-American population gradually but persistently increased from the late 1600s through the late 1700s.

Literature and Document Search

Prior to the field portion of this survey, background research for this project was conducted on-line at the Louisiana Division of Archaeology (LDOA) database website (LDOA 2011). A 0.5 mile radius along the survey corridor was utilized in a search for previously recorded archaeological sites. The resulting information shows six previously recorded archaeological sites, all historic structure sites, located within the search parameters, including north to south: Site 16CU23 (located on the north bank of the Houston River), Sites 16CU172, 16CU201, and 16CU198 (located near the Bayou d'Inde crossing), and Sites 16CU29 and 16CU30 (located along the ship channel south of the origin point). None of these sites will receive any impact as they are well away from the actual project corridor.

Research at the LDOA office in Baton Rouge for prior projects conducted in the general vicinity of the pipeline corridor showed only three surveys. Joseph V. Frank, III conducted a survey along the north bank of the Calcasieu Ship Channel, south of this project area, for a proposed industrial plant (Frank 1991) with no cultural resources discovered. Frank also conducted a survey just east of the origin point of this survey for a proposed chemical plant, again with no cultural resources discovered (Frank 1988). Finally, EMANCO, Inc. conducted a survey for a proposed railroad right-of-way, which crosses this corridor on an east-west orientation, approximately one mile south of the Houston River (Weed et al. 1993). Again, no cultural resources were discovered as a result of the project.

Also researched were early 20th century maps of the area to note the locations of any potential historic structure sites along the proposed corridor. The earliest maps located were the 1955 Sulphur, LA. and 1956 Da Quincy, LA. 7.5' topographic maps. No early soil maps, highway maps or other early 20th century maps were located. The maps reviewed showed a few structures not visible on the current map, including a cluster of buildings along the south side of Highway 90 where the proposed corridor will be located. These locations were plotted on

topographic maps for reference during the pedestrian survey. None of the other structures visible are located within the actual survey corridor.

Field Methods

Field investigations consisted of a pedestrian walkover employing visual inspection of exposed surface areas and subsurface shovel testing. As required in the state of Louisiana, all shovel tests had a minimum diameter of 30 cm and were excavated to recognizable, culturally sterile subsoil. All removed soil was screened through 6 mm (¼ in) mesh screen in an effort to locate cultural materials. Soil profiles were recorded for each shovel test noting soil colors, soil textures, and depths of soil texture/color changes. A total of 197 shovel tests were excavated in the course of this survey (Figures 1-5).

Where soil was visible at the surface, initial investigations consisted of ground surface inspection. The locations included bare soil exposures along natural slopes, plowed fields, drainages, road cutbanks, road surfaces, and erosional surfaces. However, most land within the survey corridor had limited surface visibility. Where visibility of the soil surface was limited, shovel tests were excavated at 30 m intervals in those areas with a high probability of containing archaeological sites. Such high probability areas were limited in extent and consisted of landforms with relatively level settings (areas of <10% slope) and terraces adjacent to intermittent and permanent water courses. These 30 m interval methods were also limited to those settings showing an absence of disturbance from prior timber planting and harvesting activities and from erosion that has removed upper soil horizons. Lower probability areas were sampled at greater intervals ranging up to 50 m. These areas included tracts of planted pine, mechanically disturbed areas and residential/commercial lots. Slopes greater than 20 percent were only visually inspected, although due to the general low-lying environmental setting of this survey area, there is very little "excessively" sloping terrain present along the corridor. Also not shovel tested were large areas of standing water such the back swamp that abuts the Houston River, or hydric soiled, quasi-wetland areas. In these areas, shovel testing was limited to isolated rises, in particular the pimple mounds that are a unique feature in this region.

The field survey originated at the northern terminus of the pipeline along Bankins Road. While an existing station is present, a new meter station will be constructed at this location for this pipeline (Figure 6). The proposed pipeline runs east adjacent to the north side of Bankins Road, first across a series of residential lots, then through a stand of planted pine before turning to the south, extending through a secondary growth wooded area that is adjacent to an area of open pastures/farm lots to the west (Figure 7). Shovel testing in this general area showed similar soil profiles of light grey to grayish brown, powdery, silty soil, with ferrous staining and dark brown silty clay mottles, underlain by yellow-brown silty clay subsoil (Figure 8). Just south of the woods, the line turns to the southeast, now situated in secondary growth pine and hardwoods adjacent to the western edge of an existing transmission line ROW (Figure 9). Shovel tests show

a continuation of the profiles noted above, with a grey, very fine, almost powdery consistency in the upper soil zone, becoming more mottled and hardpacked with depth. Further south, the line crosses a large, open pasture, then through more secondary growth woods, prior to reaching a large relic clearcut area. Soils continue to show the same general soil profile noted above, although in the open field, the initial color is more of a pale brown, becoming yellow-brown with depth. Very little shovel testing was utilized in the relic clearcut due to surface exposure and extensive surface impact from machinery. Soils in this area also reflected the close proximity of the river to the south, with near hydric soil profiles (pale grey damp silty clay loam mottled with rust, brown and yellow mottles) evident in a majority of the shovel tests excavated (Figure 12).



Figure 6. West view of north terminus of pipeline at proposed meter station tie-in.



Figure 7. South view of corridor set in woods to east and pasture to west.



Figure 8. Typical soil profile along this portion of pipeline route.



Figure 9. South view of transmission line ROW alignment.



Figure 10. South view of relic clearcut.



Figure 11. Southeast view of bottomland north of railroad ROW.



Figure 12. Typical bottomland soil profile.

At this location is a somewhat linear TWA for equipment/pipe storage (Figure 4). It is oriented somewhat northeast/southwest. There are several large open areas of exposure within the TWA, which were visually inspected. As noted above, shovel testing indicated soils are quasi-hydric in profile, and few were excavated. The pipeline now turns to a more southerly orientation, aligned with the west side of a railroad ROW. The next .5 miles (.8 km) or so of the corridor is set in a standing water back swamp adjacent to the Houston River (Figure 13). The edge of the ROW along the tracks was walked and the terrain was scrutinized for any evident rises such as pimple mounds within the survey corridor, with no area noted as suitable for testing. South of the river, a small stream runs along the west side of the railway ROW within the survey corridor. No suitable terrain was located along this particular low-lying segment either. Further south, the corridor extends through an area of mixed open pastures/farmland and wooded tracts. Periodic shovel testing showed continuing, near hydric soil conditions, with soil profiles showing an average of 14 cm of light grayish-brown fine silty clay loam mottled with ferrous staining, dark brown and yellow-brown silty clay mottles, underlain by yellow-brown mottled silty clay to at least 30 cmbs (Figure 14). The terrain and soil profiles remain relatively consistent until just north of Hardey Road, where the terrain rises up slightly in elevation. A small cemetery is located within the ROW, adjacent to the east side of Hardey Road (Figure 15). The small, fenced cemetery is recent and contains two interments in small vaults. Further information is provided in the *Inventory of Cultural Resources* section of this report. South of the cemetery the corridor extends past a series of small residential lots and small wooded tracts that border the railroad ROW. The line then crosses Evergreen Road and is now still aligned with the railroad to the east, with secondary growth pine and hardwood secondary growth woods along the actual survey corridor. The terrain for the next 1.6 miles (2.5 km) is all low-lying, with evidence of periodic inundation in many areas. The main features evident along this segment are the many isolated pimple mounds that rise up from the surrounding terrain. While most are small, at less than 5 m in diameter, and less than 2 m above the surrounding terrain, others were noted as large as 30 m to 40 m in diameter, and estimated at 3 m or higher than the surrounding terrain (Figure 16). Each of the pimple mounds larger than approximately 5 m in diameter present within the corridor was tested with at least one shovel test. Larger mounds received at least two or more shovel tests depending on size. In general, the mounds showed a similar soil profile of 3 to 4 cm of dark grayish-brown humus/rootmat, underlain by 14 cm of off white to light grey, fine to powdery silt, underlain by pale yellow to pale grayish-brown, hardpacked silt (Figure 17). Other than some isolated railroad associated debris (crossties, metal fittings) on the surface of a few of the mounds, no cultural material was recovered from this segment of the pipeline.

As the corridor crosses Highway 90, the alignment extends through a more industrial setting, crossing some small wooded tracts, and running adjacent to an existing transmission line ROW. Just south of Hwy 90 is the location for a possible alternate route, less than .4 mi (.6 km) in distance. At this location is a large, wooded lot, set within an industrial setting of small businesses and manufacturing facilities. The main route will extend west along the Hwy 90 frontage for a short distance, then turn south, following the east side of Walcott Road within the wooded lot, then turning southwest, crossing Wolcott Road and aligning with an existing



Figure 13. Southwest view of swampy terrain north of Houston River.



Figure 14. Hydric soil profile in shovel test.



Figure 15. South view of Hardey Cemetery on corridor.



Figure 16. South view of pimple mound along railroad alignment.



Figure 17. Typical pimple mound soil profile.

transmission line ROW along the northwest side. The alternate route will extend around the east side of the wooded lot, then turn west along the south side of the lot and realign with the original routing of the line. As noted on the 1955 topographic map of the area, the wooded lot had several buildings depicted at this location along the Hwy 90 frontage. A walkover of the general area within the lot indicated the area had been occupied by some structures, but none are currently standing. There is a large amount of construction/building refuse scattered within the woods. Material noted included cinderblocks, machine made brick, modern glass, roofing shingles, and metal, along with scattered household refuse. Shovel testing within the wooded lot produced only modern debris, such as bottle glass, brick fragments and rusted metal. With no evidence of historic materials present nor structural remains located, the location was not further tested. Further south, the line will be directional drilled beneath the Interstate 10 corridor. South of I-10, the line runs along the east side of Bayou d'Inde Pass Road and an adjacent pipeline ROW. The wooded setting of the pipeline is low-lying with saw palmetto, cypress, and other wetland plants present (Figure 18). Shovel testing revealed hydric soils present at the surface.

This alignment continues till the crossing at Bayou d'Inde. A long, linear TWA extends to the northeast, a short distance north of where the direction drilling recovery will occur. The terrain along the TWA is low-lying and subject to periodic inundation. Soils were hydric in profile. The pipeline drill set up will be in a partially open pasture on the south bank of the bayou. At this location, a slight rise is present in the field, with a few mature isolated hardwoods



Figure 18. East view of drainage along north Bayou d'Inde Pass Road corridor.

present. A scatter of historic material was recovered during shovel testing in close proximity to the trees, indicative of a former house site. Approximately 20 m to the south is a partially collapsed wood framed outbuilding. Further details related to this discovery are provided in the *Inventory of Cultural Resources* section of this report.

South of the site, the pipeline corridor extends through an area of secondary growth woods, emerging at an open, transmission line corridor (Figure 19). The line will be located along the east side of the ROW. The terrain within the woods is generally low-lying with near hydric soil profiles consisting of mottled, fine to near powdery pale brown silty soils. A few isolated pimple mounds are present, which were tested if they fell within the survey corridor, although no cultural material was recovered. North of Bayou d'Inde Road, is a large TWA for use during the boring operation to the south. The soils in the field are hydric, indicative of the low-lying nature of the terrain. Plans are to drill beneath a large industrial plant that sits adjacent to the south side of the road, with the recovery operation set up at this location. South of the plant is a large open field that has been mechanically cleared and had the terrain extensively re-shaped in preparation for construction of the chemical plant that will produce the carbon dioxide this pipeline will transport (Figures 20-21). This is the origin point of the pipeline, where the drill set up will be. The general surface is void of any vegetation. No shovel testing was conducted in this general area due to the extensive prior mechanical impact.



Figure 19. North view of transmission line ROW north of Bayou d'Inde Road.



Figure 20. South view of mechanical impact at southern origin point of pipeline.



Figure 21. Southwest view of rise containing Site 16CU73.

Laboratory Methods and Collection Curation

All cultural materials recovered during the project were transported to the David L. DeJarnette Laboratory at Moundville Archaeological Park in Moundville, Alabama for processing and analysis. Laboratory analysis followed accepted standard procedures involving washing of all recovered materials, sorting by artifact class, and tabulation of all artifacts. During the analysis process, artifacts were placed into archival bags with permanent provenience information and prepared for permanent curation. All cultural material, photographs, field notes, maps, and documentation pertinent to the survey will be curated at the Louisiana Division of Archaeology (LDOA) located in Baton Rouge, Louisiana.

Inventory of Cultural Resources

As a result of this project, one site, Site 16CU73, has been added to the Louisiana State Site File. The following is a brief description of the site, the procedures used to investigate the site, the result of these investigations, and an evaluation with regard to its eligibility for the NRHP.

Site 16CU73

Topographic Map: Westlake
Elevation: 10 ft AMSL
Maximum Depth: 13 cmbs
Degree of Disturbance: 90%
Topographic Association: Rise on Terrace
Distance to Water: 25 m
Ground Cover: Grass-Pasture
Zone: 15 *Easting*: 470202 *Northing*: 3341678
Site Size: 20 m by 10 m
Vegetation: Pasture with isolated trees
NRHP Status: Considered Ineligible
Nearest Water Source: Bayou d'Inde
Direction to Water: North
Cultural Affiliation: Mid 20th Century

Research Methods: Pedestrian survey and shovel testing

Comments: Site 16CU73 consists of a sparse, subsurface scatter of artifacts located on a rise on a terrace on the south bank of Bayou d'Inde (Figure 1). The general area is mixed open pastures and small stands of trees, with continuing woods further to the south and west. Bayou d'Inde Pass Road is located less than 400 ft to the northwest. A large tree standing at the crest of the rise in the field had a sparse amount of modern debris scattered around it (Figure 21). The general area was walked over and no evidence of any structural remains was noted. Twelve shovel tests were excavated in the general proximity of the tree with three positive for cultural material recovery, averaging four items per positive result (Figure 22). All material was recovered in a shallow, 13 cm thick on average, pale brown silty loam upper soil zone, underlying the initial rootmat. Below is hardpacked, yellow-brown silty clay to at least 30 cmbs (Figure 23). Recovered material included wire nails, unidentified metal, clear bottle glass, and undecorated whiteware. Approximately 20 m southwest of the large tree is a small wood framed outbuilding. The structure is constructed with machined wood, wire nails weatherboard siding and has brick pier supports along with corrugated metal roofing. An attached structure has collapsed, also constructed of the same building materials. Testing around the perimeter of the outbuilding yielded no cultural material.

Recovery Technique: Shovel Testing

Materials Recovered:

Shovel Test 1				
Group	Category	Remarks	Ct.	Wt (gr)
Ceramics	Whiteware	Plain	2	9.4
Glass	Bottle, Clear	Neck	1	3.3
Metal	Wire Nail	Fragment	2	16.7
Shovel Test 2				
Glass	Bottle, Clear	Base	1	23.9
Metal	Bolt		1	6.4
Brick	Machine Made	Fragment	1	30.1

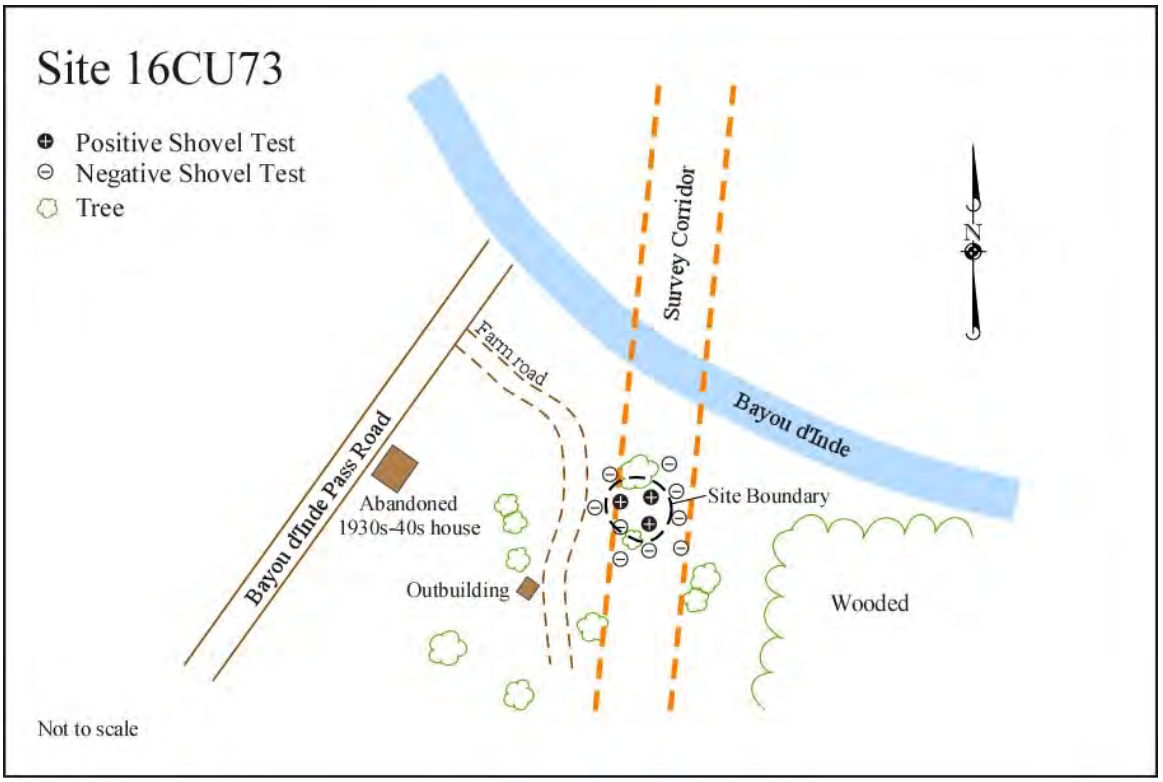


Figure 22. Sketch map of Site 16CU73.



Figure 23. Soil profile at Site 16CU73.

Shovel Test 5

Group	Category	Remarks	Ct.	Wt (gr)
Glass	Bottle, Clear	Base	1	23.2
Glass	Bottle, Clear	Body	1	6.1
Metal	Wire Nail		1	5
Metal	Unidentified		2	16.8

Cultural Affiliation: Mid 20th Century

Evaluation/Recommendations: Based on the absence of any structural remains associated with a residence, sparse, relatively modern cultural material recovery and the absence of any structural remains, the site is not considered significant. Further testing is not likely to yield insightful information about this site or the history of the area. As such, Site 16CU73 is not considered eligible for the NRHP and no further investigation is considered necessary.

Hardey Cemetery

Location: UTM Zone 15 Easting 470082, Northing 3348423 NAD 83.

This small, cyclone fence lined, modern cemetery lies directly within the proposed pipeline corridor (Figure 3). The cemetery is located on the east side of Hardey Road, just before it basically dead-ends into the pipeline corridor (Figure 24). The cemetery was established in 1988 and has two interments (Figure 25). Plans are to set up and directionally drill beneath the cemetery a minimum of 10 ft (3 m) in depth to avoid any impact on the burials present.



Figure 24. East view of Hardey Cemetery.



Figure 25. Close-up of monument at gate of Hardey Cemetery.

Results

As a result of this survey, approximately 11 miles (17.7 km) of pipeline corridor have been surveyed, along with TWA's extending off of the pipeline corridor for pipe storage during directional drilling operations. In addition, eight access roads, and a 0.5 acre (.2 ha) meter station were also investigated. The investigations resulted in the discovery of one site, Site 16CU73, which has been added to the Louisiana State Site File. The site represents a possible home site of a mid 20th century vintage, although no evidence of any structural features were located in the general area of the recovered material. In addition, the structure is not depicted on the 1955 topographic map of the area. The lack of any diagnostic materials such as decorated ceramics, vintage bottle glass, or other datable material suggests the possibility this material represents a more recent trash dump. The nearby wood framed outbuilding, which lies at the edge of the pipeline corridor, is likely associated with another abandoned wood framed residence located west of the pipeline corridor adjacent to Bayou d'Inde Road (Figure 26). This structure does appear on the 1955 topographic map, although the outbuilding itself does not (Figure 1).



Figure 26. East view of abandoned house on Bayou d'Inde Pass Road near 16CU73.

A modern cemetery (Hardey Cemetery) was also found to be located directly within the proposed pipeline corridor. Plans are to drill the pipeline beneath the cemetery to avoid any impact.

Recommendations

Based on the determination that Site 16CU73 is not considered eligible for the NRHP, it is the opinion of this office that construction of the Lake Charles Pipeline Lateral Project will have no adverse effect on any significant cultural resources and it is recommended that it be cleared from a cultural resources perspective. It is also recommended that directional drilling beneath the Hardey Cemetery be conducted so as to avoid any potential impact on the burials present. A drilled depth of 10 feet (3 m) at minimum below the surface of the cemetery is advised.

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APPENDIX A

DRAFT REPORT

STATE OF LOUISIANA SITE RECORD FORM

Site Name: **Site Number:** 16CU73

Other Site Designations:
Parish: Calcasieu
Instructions for Reaching the Site: From Intersection of I-20 and Highway 27 in Sulphur, head south on Hwy27 to Bayou d'Inde Road on the left. Turn left till the intersection with Bayou d'Inde Pass Rd. Turn left and proceed to dead-end at bayou. Go through gate to the south. Site is on evident rise in open pasture 300 ft from gate.
7.5' USGS Quadrangle (name, date): Westlake 1955 (revised 1967, 1975)
SE ¼ **of the** SE ¼ **of the** NW ¼ **of** **Section:** 8 **Township:** 10S **Range**: 9W

UTM CP Coordinates: **Zone**: 15 **Easting:** 470202 **Northing:** 3341678 **NAD:** 83

Geographical Coordinates: **Latitude:** _____ **Longitude:** _____

Geographical Setting

Landform: Rise on terrace
Distance and Direction to Nearest Water: Bayou d'Inde 15 m to the northeast
Soil Series: Sharkey silt loam

Site Investigation and Description

Survey Method(s): Shovel Testing
Site Size: 20 x 10
Site Shape/Plan: Circular
Representative Stratigraphy: 13 cm of pale brown, silty loam, underlain by 30 cm of brown, silty clay, mottled with ferrous staining and yellow-brown silty clay.
Depth of Deposit: 13 cm
Cultural Features: None
Cultural Affiliation: Mid 20th Century
Site Function: House site/dump
Description of Material: Undecorated whiteware, clear bottle glass, wire nail, unidentified metal

Site Condition

Present Use: Pasture
Disturbance: Yes please explain in the Narrative

Site Evaluation

Research Potential: Not Significant
Recommend Further Work: No

Records

Owner and Address/Contact Info: Henry Marvin Moss c/o Jill Hines (337-217-4940 wk)
References:
Permanent Disposition of Current Collection: LDOA

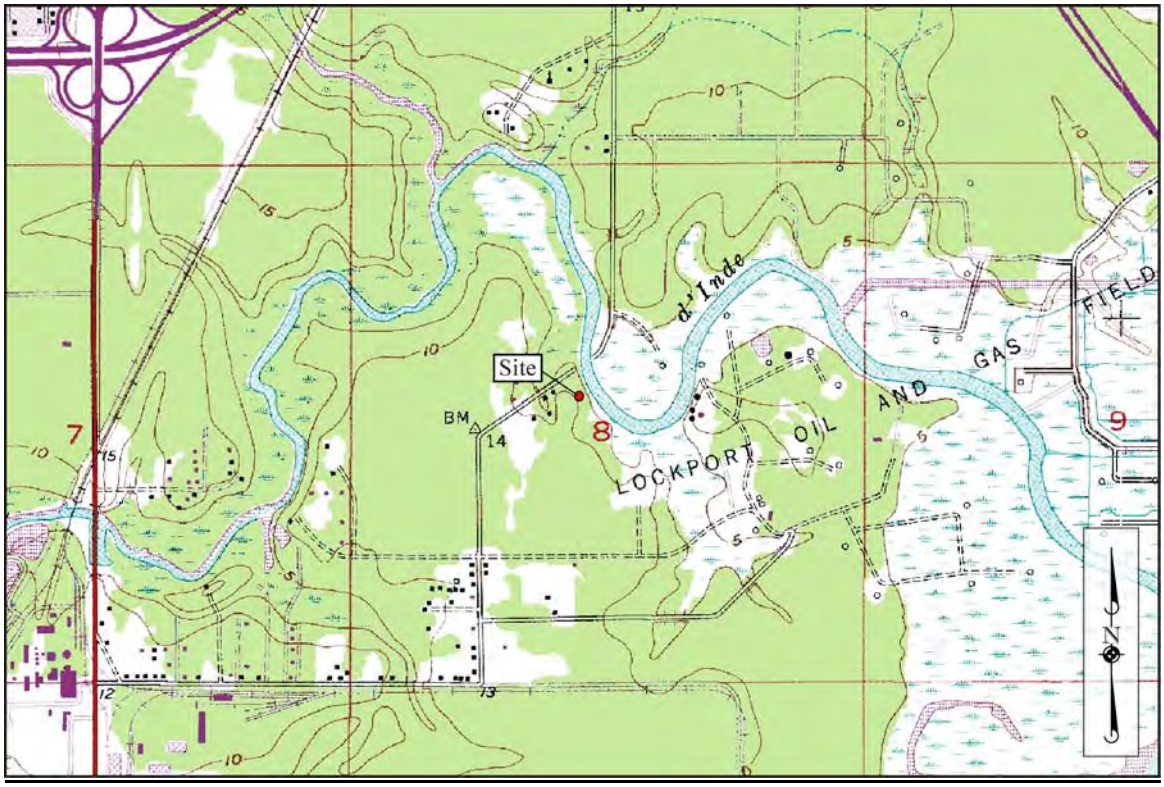
Recorded By: Joel H. Watkins
Company/Organization Contact Info: University of Alabama, Office of Archaeological Research
Date: May 13, 2011

DRAFT REPORT

STATE OF LOUISIANA MAP PAGE

Site Name: **Site Number:** 16CU73

USGS 7.5' Quadrangle Map of Site Area



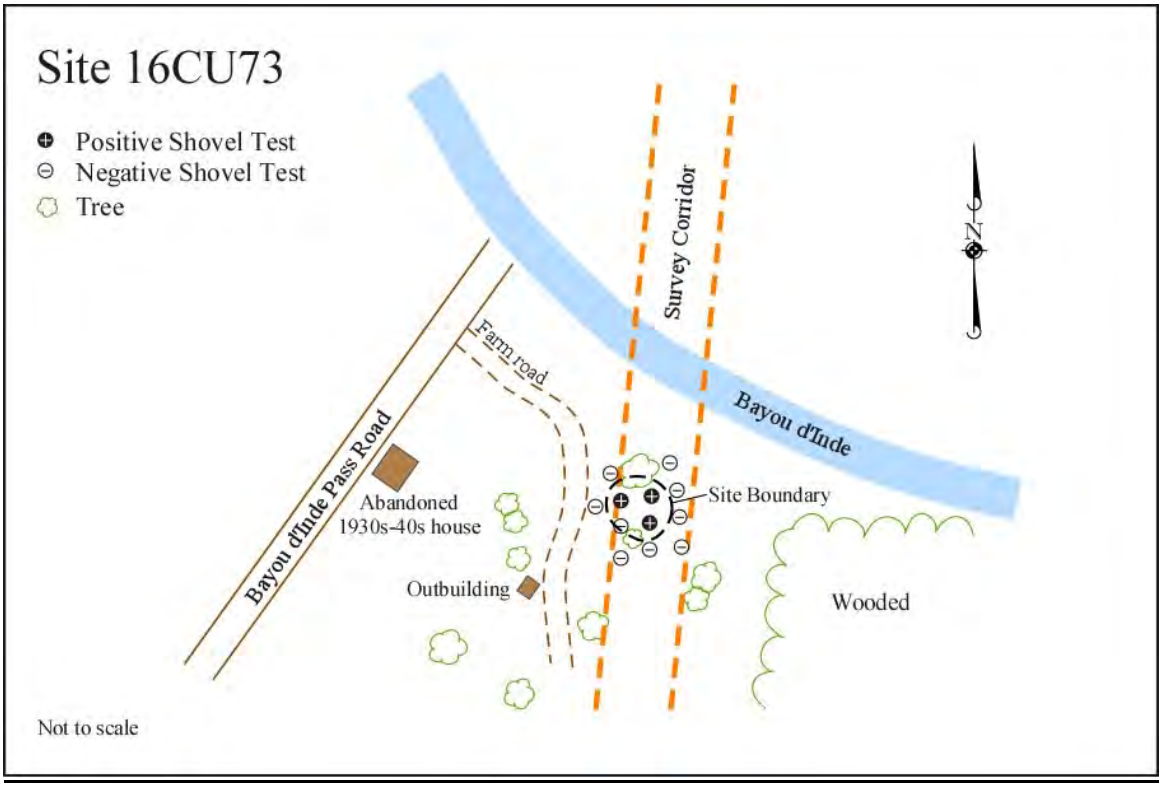
7.5' Westlake, La topographic quadrangle 1955 (revised 1967, 1975)

DRAFT REPORT

STATE OF LOUISIANA SITE MAP PAGE

Site Name: **Site Number:** 16CU73

Site Sketch Map



Drawn by: Joel H. Watkins
Date: 4/19/2011

STATE OF LOUISIANA PHOTOGRAPH FORM

Site Name: **Site Number:** 16CU73

Site Overview Photograph



Southeast view of rise with scatter present
Photo taken: 4/19/2011



Outbuilding near artifact scatter.
Photo taken: 4/19/2011

DRAFT REPORT

STATE OF LOUISIANA NARRATIVE PAGE

Site Name: **Site Number:** 16CU73

Please provide a brief summary of the geographical setting and site condition. This information may include site elevation, slope, other potential resources, other nearby sites, past/current environmental information, site orientation on the landscape, collecting conditions such as ground visibility, and any possible future threats to the site. Also use this page to elaborate on any of the sections on the site form, including additional UTM coordinates for the site boundaries.

This site is located on a noticeable rise in a pasture/field adjacent to the south bank of Bayou d'Inde, approximately 300 ft south of Bayou d'Inde Pass Road. A small stand of trees is situated on the rise, and a sparse surface scatter of debris including machined wood, shell, bottle glass and metal is scattered around on the surface in close proximity to the tree. None of the visible material was determined to be historic in association ie. 50 yrs or older. Shovel testing in the general vicinity resulted in 3 of 12 shovel tests positive for cultural material recovery. A walkover of the general area resulted in the discovery of a small wood framed outbuilding approximately 25 m southwest of the tested area. The outbuilding is constructed of machined 2x4's, wire nails, corrugated metal roofing and has weatherboard siding. Brick piers support the building, and an attached structure to the rear has collapsed. Hay is currently being stored in the building. Shovel testing around the perimeter of the outbuilding yielded no cultural material. Based on the material recovered from the initial shovel testing grid, the validity as a home site is questionable. The site represents a possible home site of a mid 20th century vintage, although no evidence of any structural features was located in the general area of the recovered material. In addition, the structure is not depicted on the 1955 topographic map of the area. The lack of any diagnostic materials such as decorated ceramics, vintage bottle glass, or other datable material suggests the possibility this material represents a more recent trash dump. The nearby wood framed outbuilding may be associated with another, abandoned wood framed residence located west of the pipeline corridor adjacent to Bayou d'Inde Road. This structure does appear on the 1955 topographic map, although the outbuilding itself does not. Based on this data, the site is not considered to be eligible for the National Register of Historic Places. This location is within the general corridor boundaries for a proposed pipeline that will be directionally drilled beneath the bayou. The outbuilding sits at the perimeter of the corridor and will not be impacted by drilling operations. As the site is not considered significant, no further testing is recommended.

DRAFT REPORT

LACAD CODING FORM

Site Name: Site Number: 16CU73

Landform (1 Entry)

☐ **kn**	Knoll	☐ **sd**	Salt Dome	☐ **bea**	Beach	☐ **nrs**	Nat Relic Scar
☐ **rid**	Ridge	☐ **swa**	Swamp	☐ **udw**	Underwater	☐ **bat**	Batture
☐ **bn**	Bench	☐ **bsw**	Backswamp	☒ **nal**	Natural Levee	☐ **ot**	Other, see site
☐ **pm**	Pimple Mound	☐ **msh**	Marsh	☐ **chr**	Chenier		form

Cultural Features (up to 4 Entries)

☐ **sar**	Single Artifact	☐ **psc**	Prehistoric Scatter	☐ **ls**	Lithic Scatter
☐ **md1**	Mound/Earthwork	☒ **hsc**	Historic Scatter	☐ **bu**	Burial(s)
☐ **md2**	Mounds/Earthworks	☐ **hst**	Hist. Sheet Midden	☐ **ss**	Standing Structure
☐ **her**	Historic Earthwork	☐ **shm**	Shell Midden	☒ **du**	Dump
☐ **ote**	Other Earthwork	☐ **erm**	Earth Midden	☐ **hr**	Historic Ruins
☐ **sw**	Shipwreck(s)				

Cultural Affiliation (up to 7 Entries)

☐ **pu**	Prehistoric (Unknown)	☐ **tc**	Tchefuncte	☐ **cm**	Caddo – Middle
☐ **pal**	Paleo-Indian	☐ **mar**	Marksville	☐ **cl**	Caddo – Late
☐ **au**	Archaic (Unknown)	☐ **is**	Issaquena	☐ **hu**	Historic (Unknown)
☐ **ea**	Early Archaic	☐ **ba**	Baytown	☐ **hi**	Historic Indian Contact
☐ **ma**	Middle Archaic	☐ **tro**	Troyville	☐ **ex**	Historic Exploration 1541-1803
☐ **la**	Late Archaic	☐ **cc**	Coles Creek	☐ **ant**	Antebellum 1803-1860
☐ **po**	Poverty Point	☐ **pq**	Plaquemine	☐ **war**	War & Aftermath 1860-1890
☐ **wu**	Woodland (Unknown)	☐ **ms**	Mississippian	☒ **in**	Industrial & Modern 1890-
		☐ **cad**	Caddo (Unknown)		
		☐ **ce**	Caddo – Early		

Remarks _____

Site Function (up to 3 Entries)

☐ **pu**	Prehistoric (Unknown)	☒ **fa**	Farmstead	☐ **ci**	Commercial/Service Cen.
☐ **hu**	Historic (Unknown)	☐ **wt**	Watercraft	☐ **it**	Institution (Rel. & Ed.)
☐ **ch**	Chipping Station	☐ **pt**	Plantation	☐ **gv**	Governmental
☐ **cam**	Camp	☐ **hs**	Hist. Town/Vill.	☐ **id**	Industrial
☐ **el**	Extraction Locale	☐ **ur**	Urban	☒ **du**	Dump
☐ **ha**	Hamlet/Village	☐ **cr**	Cemetery (Mort.)	☐ **ml**	Military
☐ **cer**	Ceremonial Center	☐ **ht**	Hist. Transport	☐ **rs**	Residence

Remarks _____

Description of Material (up to 6 Entries)

☐ **cra** Ceramics, Native American	☐ **hb** Human Bone	☒ **cmt** Construction Material (Brick, Wattle & Daub)
☒ **hc** Ceramics, Historic	☐ **wb** Worked Bone	☐ **pi** Personal Items (jewelry, clothing, personal care)
☐ **cs** Chipped Stone	☐ **ub** Unmodified Bone (Fauna)	☐ **toy** Toys (dolls, marbles, tea set)
☐ **gs** Ground Stone	☐ **fl** Flora	☐ **rec** Recreation Items (chunky stones, dominoes, dice)
☐ **fcr** Fire Cracked Rock	☒ **gl** Glass	☐ **rp** Rubber/Plastic
☐ **pp** Projectile Points	☒ **me** Metal (Nails, etc)	
☐ **she** Shell	☐ **wo** Wood	
☐ **ppo** Poverty Point Object	☐ **ch** Charcoal	
☐ **bc** Baked Clay Items		

Remarks Wire nails, plain whiteware, machine made brick, unid. metal

Method of Investigation at Site (up to 3 Entries)

☐ **vi** Visual Inspection	☐ **pr** Probing	☐ **stp** Mechanical Stripping
☐ **ma** Mapping	☐ **au** Auger Testing	☐ **tr** Trenching
☐ **gra** Grab Surface Collection	☐ **co** Coring	☐ **exc** Excavation
☐ **sy** Systematic Surface Collection	☒ **sht** Shovel Testing	☐ **di** Diver Inspection
☐ **rs** Remote Sensing	☐ **tu** Test Units	☐ **otr** Other, see narrative

APPENDIX B

DRAFT REPORT

Ms. Rachel Watson
Section 106 Review & Compliance
Louisiana Division of Archaeology
1051 N. 3rd St., Room 319
Baton Rouge, LA 70802

RE: A Phase I Cultural Resources Survey of ± 10.5 Miles of Pipeline Right-Of-Way in Calcasieu Parish, Louisiana

Dear Ms. Watson:

With reference to the above project, the University of Alabama, Office of Archaeological Research (OAR) proposes to conduct an archaeological Phase I survey of the proposed pipeline corridor and any associated temporary work areas (TWA) and access roads. All phases of the project will be conducted in compliance with the guidelines set forth by the Louisiana Division of Archaeology (LDOA) for Section 106 compliance.

Project Description

The following is a description of the proposed pipeline as provided to OAR by their client for this project, CH2MHill.

Denbury Onshore, LLC (Denbury) is proposing to construct, own, and operate a 11.8-mile carbon dioxide (CO_2) pipeline and associated ancillary equipment (Project) originating at a new industrial facility near Lake Charles, Louisiana and terminating at its existing Green Pipeline in Calcasieu Parish. The Green Pipeline is an interstate pipeline used to transport CO_2 from natural and anthropogenic sources in the southeast United States to depleted oilfields for sequestration and enhanced oil recovery (EOR). The new pipeline will transport more than 1 million tons per day of CO_2 emissions captured at Leucadia Energy, LLC's, Lake Charles cogeneration petroleum coke-to-chemicals plant being constructed near Lake Charles, Louisiana. The CO_2 will be transported through new and existing pipeline systems to be used for EOR at Denbury's Hastings Field located south of Houston, Texas.

The new pipeline will include a 16-inch outside diameter CO_2 pipeline, one valve, and one meter station located in Calcasieu Parish, Louisiana. The pipeline route begins just west of Lake Charles, Louisiana at Latitude: 30°11'22.39"N and Longitude: -93°18'16.07"W within an industrial facility currently being constructed and proceeds in a northerly direction for 10.5 miles to its terminus at Latitude: 30°19'36.25"N and Longitude: -93°20'32.74"W.

The meter station will be located at the terminus of the pipeline at the interconnection with the Green Pipeline, and the valve will be located about mid-way between the beginning of the route and the Green Pipeline, within the pipeline corridor. The pipeline route will parallel existing rights-of-way (ROWs) (transmission lines, roads, pipelines, railroads, and other linear features) to the extent practicable. The pipeline ROW will consist of an 80-foot temporary ROW for construction and a permanent ROW of 30-feet for operation, for a total of 110-feet of ROW to be used during construction. Also surveyed will be a 4 acre temporary work area (TWA) at Mile Post 4.2 adjacent to the south side of Hwy 90.

Proposed Testing Methodology

A Phase I cultural resources survey generally involves a literature/records search and an actual on-site field survey. Background research will be conducted via the LDOA website for pre-recorded archaeological

sites along the proposed corridor. This will provide information as to the status of any previously recorded archaeological sites, historic and prehistoric, within the area. In addition a visit to the LDOA office in Baton Rouge, La. will be necessary to gather information related to prior archaeological surveys conducted in the general proximity of the project corridor. This, coupled with a literature/records search will also identify any *National Register of Historic Places* (NRHP) properties which may be located in the project area, or in close proximity which may be visually impacted as a result of the project.

Field investigations will include a pedestrian survey of the project area. Field techniques will include visual inspection of any exposed surface areas, and the employment of 30 cm by 30 cm shovel tests spaced at regular intervals along survey transects in accordance with LDOA guidelines. High probability areas will be tested at approximate 30 m intervals, while lower probability areas will be tested at intervals up to 50 m. Probability factors include distance to water, terrain, soil type and prior impact.

In the event that any new archaeological sites are encountered, an assessment of NRHP eligibility is also necessary. Should a site not be considered eligible for the NRHP, then the site will be recommended for clearance. Should a site be considered potentially eligible for the NRHP, then avoidance or Phase II testing will be recommended. Also, this survey will identify historic structures, defined as 50 years or older with any potential for impact, visual or physical, as a result of this project. Historic structures will be evaluated to a preliminary level regarding their NRHP eligibility.

In the event human remains should be encountered during this Phase I project, work will stop immediately in the vicinity of the uncovered human remains. Notice regarding the discovery will be made as soon as possible to the appropriate local law enforcement agency and the appropriate Parish Coroner's Office following the provisions of the Louisiana Unmarked Human Burial Sites Preservation Act (R.S. 8:671-871, et seq.). The State Archaeologist will also be notified directly upon discovery. Per La. DOA guidelines, within 24-hours of notification, the State Archaeologist shall notify any Native American tribe that has indicated interest in the area where the discovery of human remains was made. The local law enforcement officials shall assess the nature and age of the human skeletal remains. If the coroner determines that the human skeletal remains are older than 50 years of age, the Louisiana Division of Archaeology has jurisdiction over the remains and will work out appropriate plans among property owners, appropriate Tribes, living descendents, and other interested parties to insure compliance with existing state laws. **No remains will be removed from the site until jurisdiction is established and the appropriate permits obtained from the Division.**

Finally, a report will be prepared per LDOA guidelines detailing the Phase I investigations in the field and laboratory and submitted to the LDOA for review. Recommendations of clearance or avoidance of any archaeological sites encountered will also be generated in the report.

Thank you for your time,

Joel Watkins
Cultural Resources Analyst
University of Alabama, Office of Archaeological Research
13075 Moundville Archaeological Park
Moundville, Alabama 35474

JAY DARDENNE
LIEUTENANT GOVERNOR

State of Louisiana

OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT

CHARLES R. DAVIS
DEPUTY SECRETARY

PAM BREAUX
ASSISTANT SECRETARY

25 April 2012

Joel Watkins
Cultural Resource Analyst
Office of Archaeological Research
13075 Moundville Archaeological Park
Moundville, AL 35474

Re: Draft Report
La Division of Archaeology Report No. 22-4007
Phase I Cultural Resource Survey of the Proposed Lake Charles Pipeline Lateral Project Located near Sulphur, Calcasieu Parish, Louisiana

Dear Mr Watkins:

We acknowledge receipt of your report dated 21 November 2011 and received in our office 16 April 2012, along with two copies of the above-referenced report. We have completed our review of this report and offer the following comments.

In the Abstract, please provide the total project acreage. We appreciate the effort to inspect all of the pimple mounds encountered within the project ROW. We request that a site form be completed for the Harvey Cemetery. This request reflects recent legislative acts that give our office regulatory responsibilities for many cemeteries and so we are making a concerted effort to record all that are encountered during projects.

We concur that site 16CU73 is not eligible for nomination to the National Register of Historic Places and that if the pipeline is directionally drilled under the Harvey Cemetery, no historic properties will be impacted by this project, and that no further work is necessary.

We look forward to receiving two bound copies of the final report with the comments addressed as appropriate, along with a pdf of the report. If you have any questions, please contact Chip McGimsey in the Division of Archaeology by email at cmcgimsey@crt.la.gov or by phone at 225-219-4598.

Sincerely,

Pam Breaux

Pam Breaux
State Historic Preservation Officer

PB:crm

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Enclosure 5

Phase IA Cultural Resources Reports for Proposed LCCE Gasification Project Offsite *Facilities*

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URS

May 16, 2012

Mr. Philip Leonards
Leucadia Energy
1330 Post Oak Blvd. Suite 1600
Houston, Texas 77056
Office - 713-963-4636
Email: pleonards@leucadiaenergy.com

Re: Cultural Resources Evaluation - Lake Charles Cogeneration, LLC (LCC), Calcasieu Parish, Louisiana

Dear Mr. Leonards:

During May of 2012, URS completed a Phase IA cultural resources desktop assessment for an approximately 5.2 mi (8.4 km) long water pipeline corridor, an 8.3 mi (13.4 km) long hydrogen pipeline corridor, and a parking area, all currently under consideration by Lake Charles Cogeneration, LLC (LCC) for the Lake Charles Gasification Facility (LCGF) in Calcasieu Parish, southwest Louisiana (Figure 1). The purpose of this desktop investigation was to identify any previously recorded cultural resources within a 0.5 mi (0.8 km) radius of the potential corridors and a 1.0 mile (1.6 km) radius of the proposed parking area and provide a preliminary assessment of the archaeological site potential of these areas. In total, these survey corridors and parking areas represented approximately 428 ac of land that was assessed for cultural resources as part of this Phase IA desktop study.

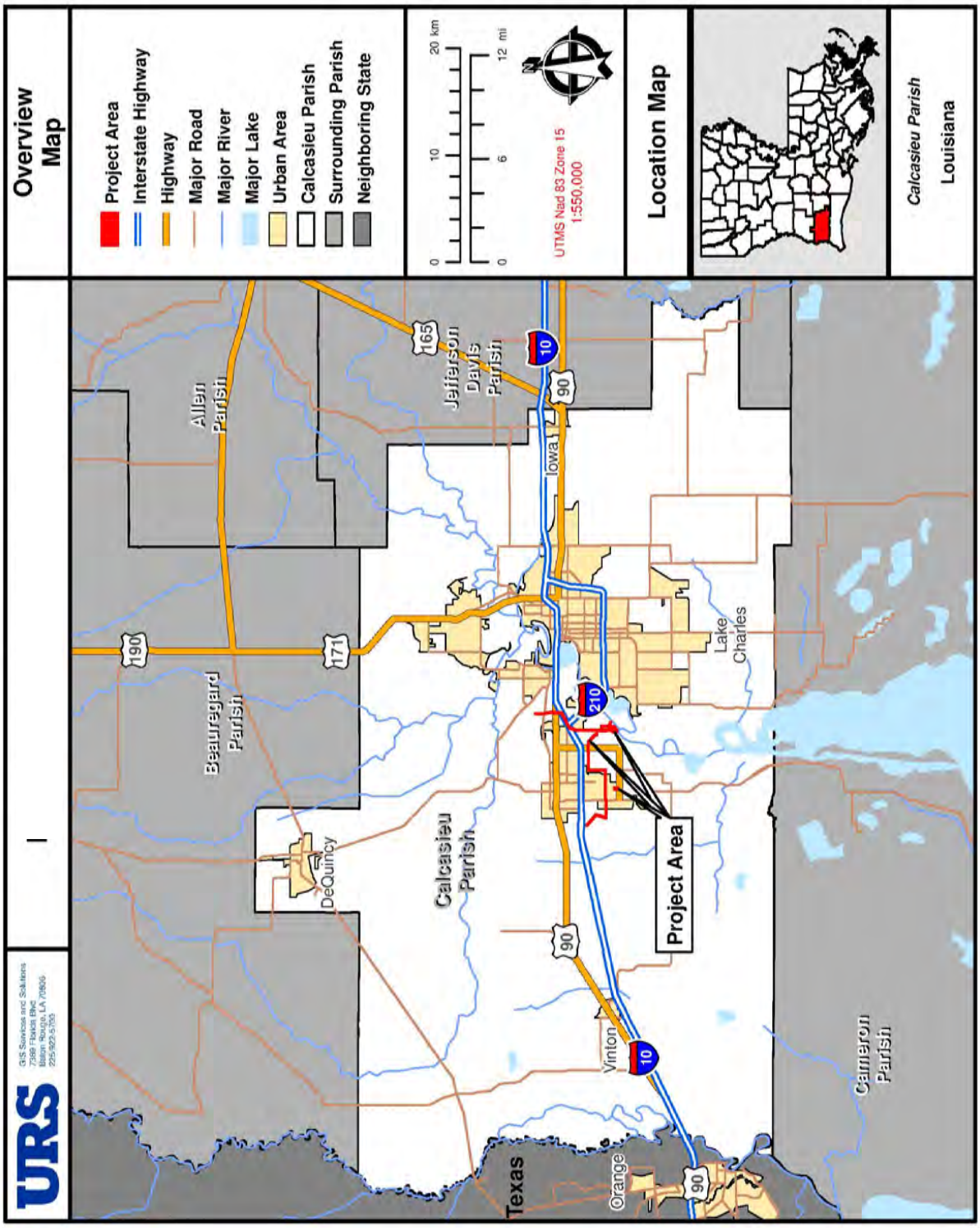
This investigation followed the general guidelines and procedures outlined in *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983), the Cultural Resource Assessment standards provided by the Louisiana Division of Archaeology (2009), the National Historic Preservation Act of 1966 (as amended), the Archaeological and Historic Preservation Act of 1974, Title 36 of the Code of Federal Regulations (Parts 60-66 and 800) and *Archeology and Historic Preservation: The Secretary of the Interior's Guidelines*.

No field studies or surveys were conducted for this project; at this preliminary stage, cultural resource data collection and evaluation was conducted on a desktop basis using only existing hard copy data, internet site information, and GIS data. A summary of the various data sources from which the information was gathered is presented below:

(1) Louisiana Division of Archaeology (site forms and cultural resource surveys), located in Baton Rouge, Louisiana;
(2) Louisiana Division of Historic Preservation/State Library (historic standing structures), located in Baton Rouge, Louisiana;
(3) Louisiana Cultural Resources Map hosted by the Louisiana Division of Archaeology;
(4) National Register of Historic Places (NRHP) online database; and,
(5) Louisiana Division of Historic Preservation National Register Website.

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Figure 1 Overview of Project Areas, Calcasieu Parish, Louisiana



The project areas were assessed to provide a technical estimate to LCC concerning the expected levels of archaeological effort (i.e., Phase I cultural resources inventory) that may be required to receive Section 106 clearance on the property.

Mr. Martin Handly (MA) served as the Principal Investigator for this project and wrote this section of the report, while Ms. Lauren Poche (MA) collected the background information, and Mr. Shane Poche (BA) prepared the graphics that appear in this section.

NATURAL SETTING

Currently, the property appears to be a mix of coastal prairie, low-gradient drainages, coastal marsh, and man-made lands. The project area is characterized by 11 soils (Figures 2 to 15; Table 1). A single soil (Clovelly muck) is associated with the coastal marsh. This predominantly inundated soil represents approximately 2.0% of the survey area. Overall, these soils are anticipated to be located on landforms with low archaeological site potential; however, low-lying natural levees associated with the bayous and drainages within the project areas are considered to display higher archaeological site potential. Given the inundated nature of this portion of the project area, visual assessment may only be required.

Table 1 Soil Table, Calcasieu Parish, Louisiana

Soil Name	Landform	Slope (%)	Drainage	%age	Archaeological Potential
Acadia silt loam	Terraces	1-3	Somewhat poorly	8.0	High
Glenmora silt loam		1-5	Moderately well	1.0	High
Basile and Guyton silt loams, frequently flooded	Floodplains	0-1	Poorly	8.3	High
Clovelly muck	Coastal Marsh	0-1	Very Poorly	2.0	High
Leton silt loam	Stream Meander	0-1	Poorly	1.3	High
Crowley-Vidrine silt loams	Coastal Prairie (Pimple Mounds)	1-3	Somewhat poorly	6.6	Low-Moderate
Guyton-Messer silt loams		0-3	Very poorly to Moderately well	9.0	Low-Moderate
Kinder-Messer silt loams		0-3	Poorly to Moderately well	39.1	Low-Moderate
Mowata-Vidrine silt loams		0-1	Poorly to Somewhat poorly	19.6	Low-Moderate
Dumps	Man-Made	Variable	Variable	1.5	Low
Urban land	Man-Made	Variable	Variable	0.1	Low
Water	Water	NA	NA	3.6	Low
			TOTAL	**100.0**	

Figure 2 Soil Maps, Calcasieu Parish, Louisiana (Map 1 of 14)

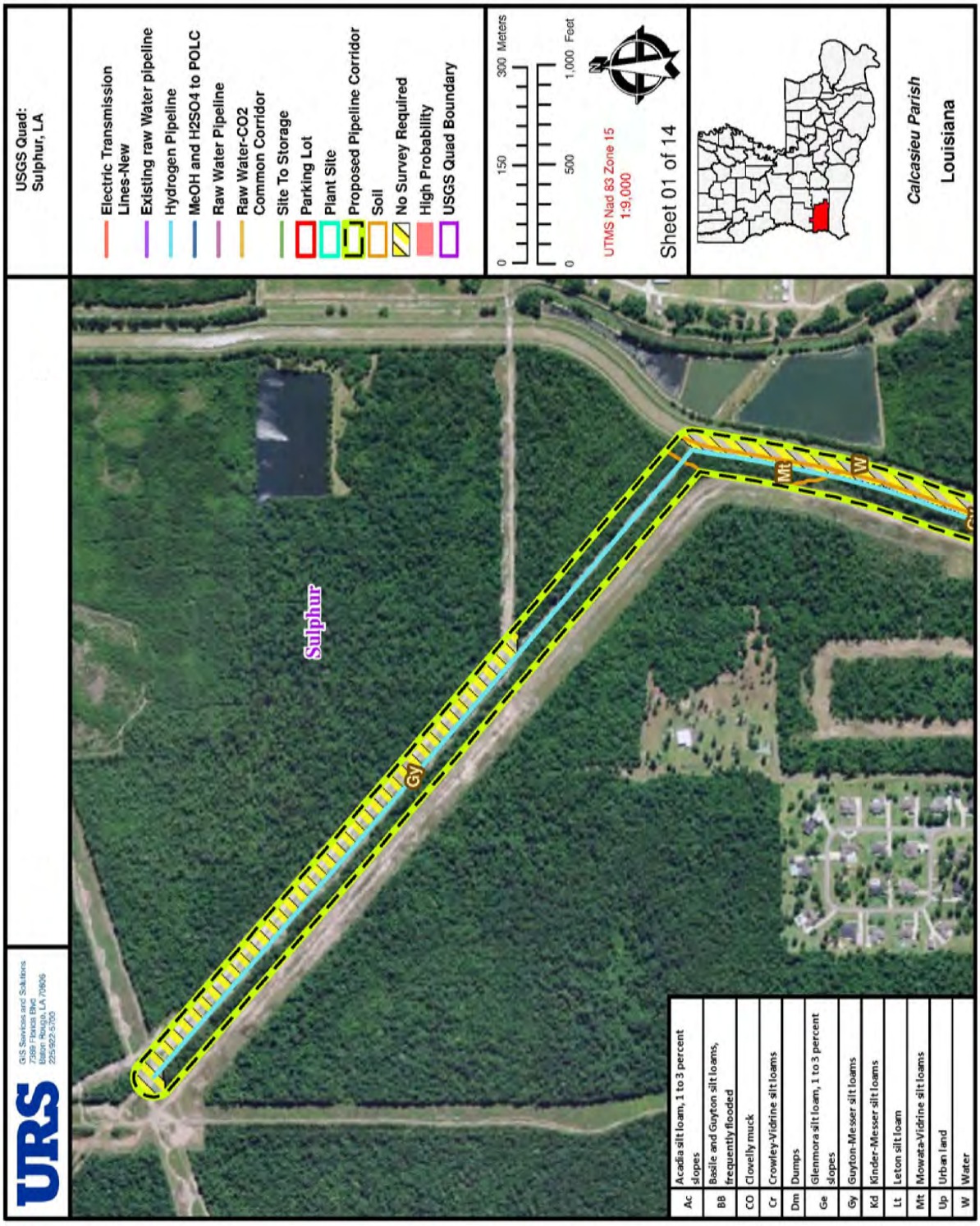


Figure 3 Soil Maps, Calcasieu Parish, Louisiana (Map 2 of 14)

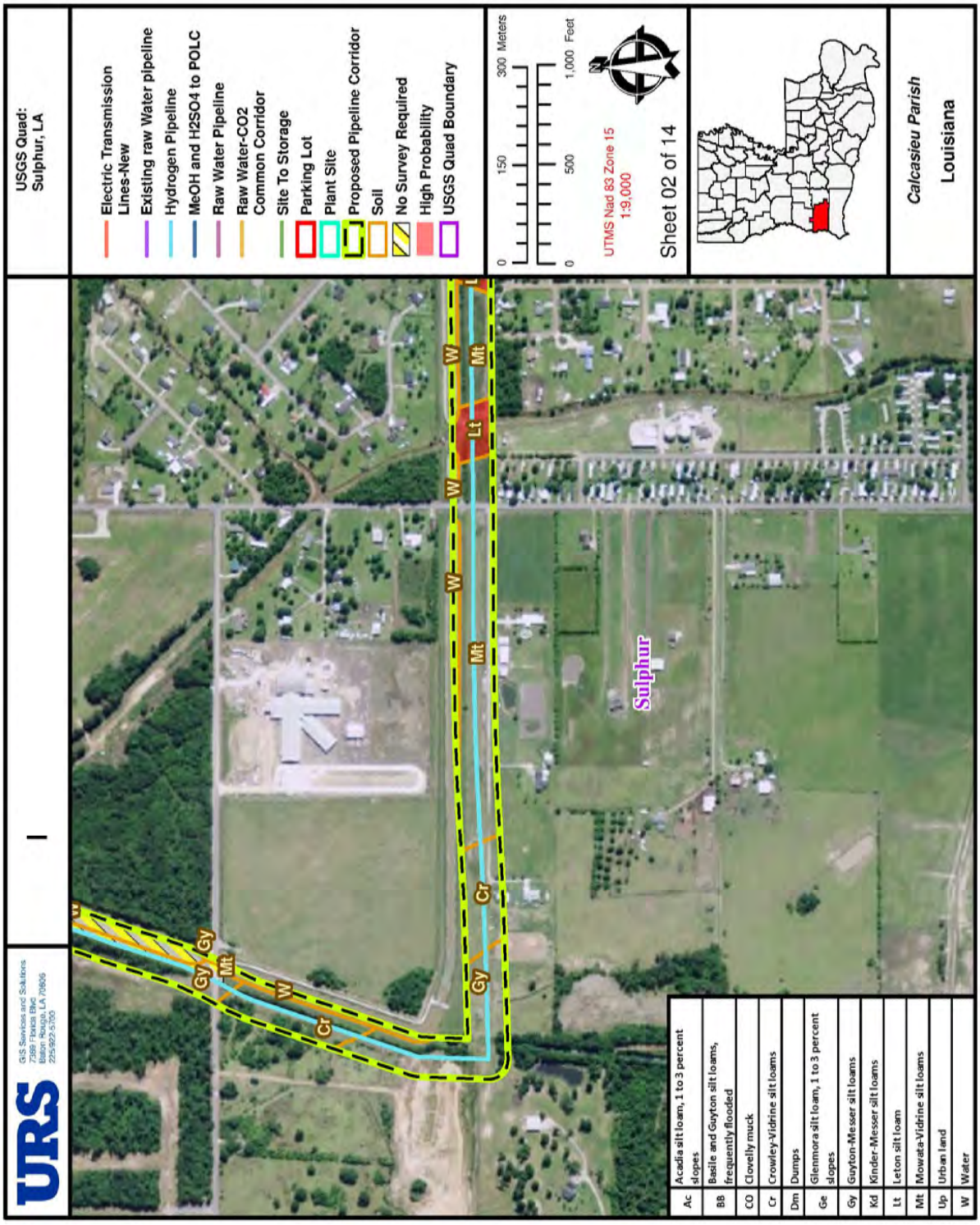


Figure 4 Soil Maps, Calcasieu Parish, Louisiana (Map 3 of 14)

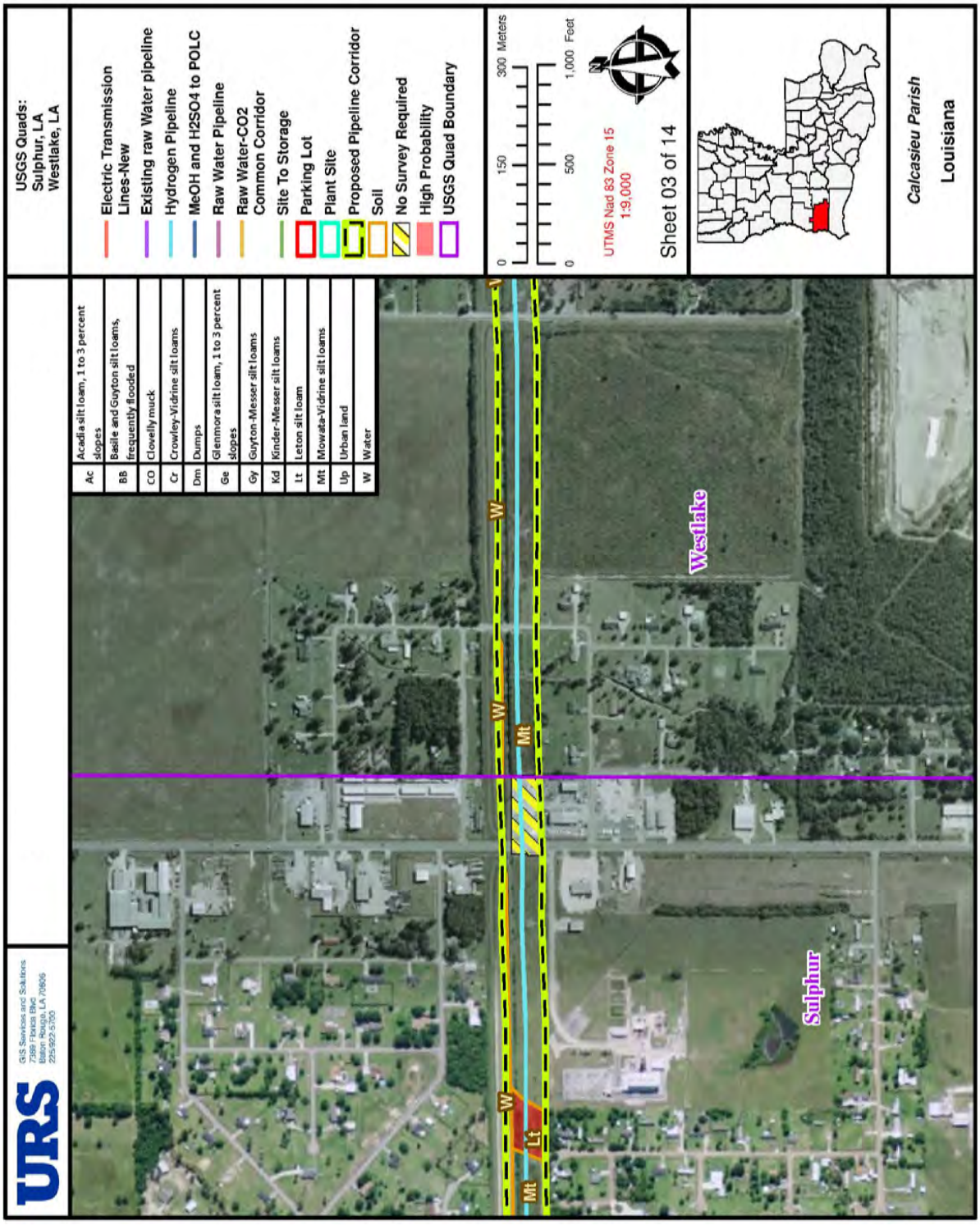


Figure 5 Soil Maps, Calcasieu Parish, Louisiana (Map 4 of 14)

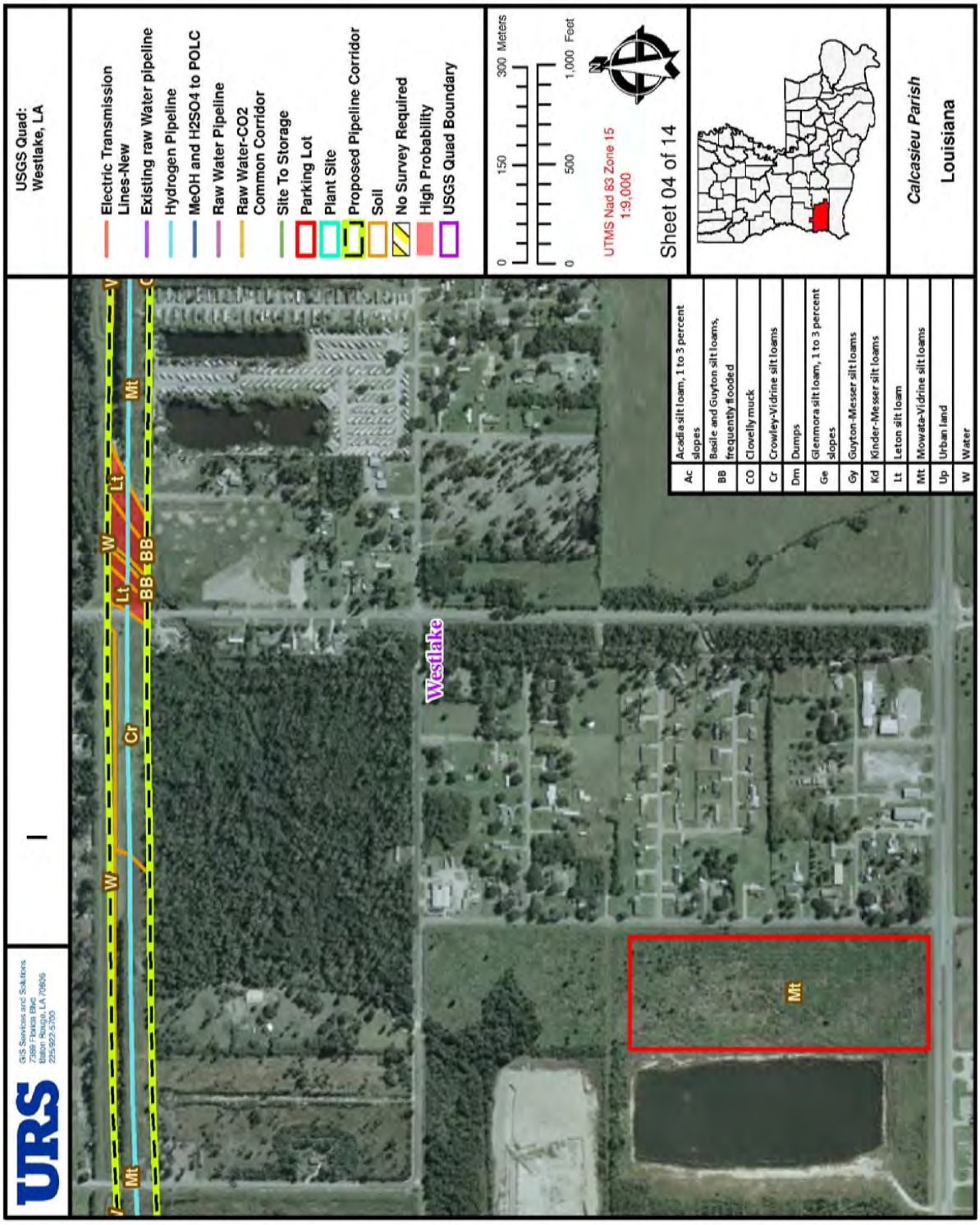


Figure 6 Soil Maps, Calcasieu Parish, Louisiana (Map 5 of 14)

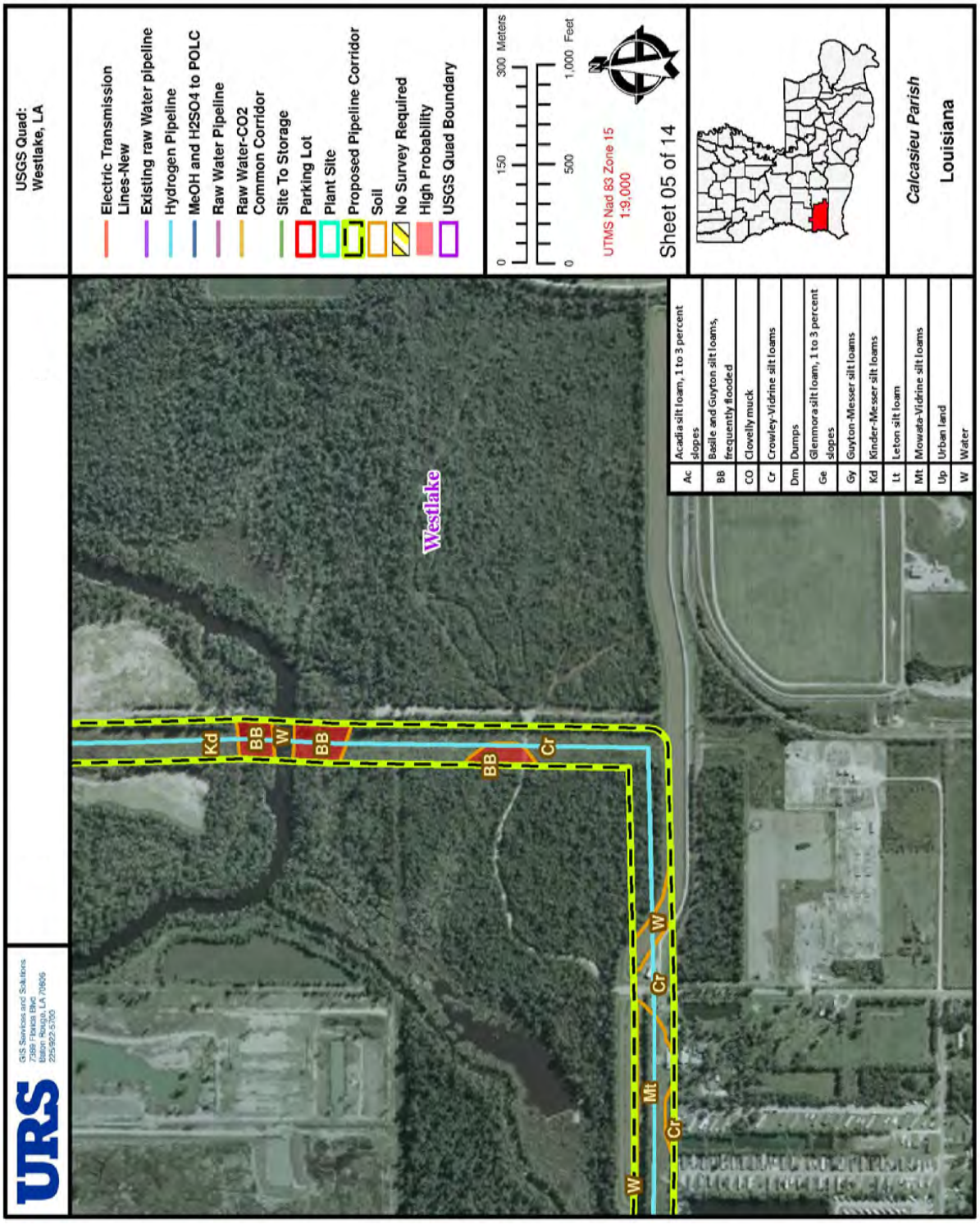


Figure 7 Soil Maps, Calcasieu Parish, Louisiana (Map 6 of 14)

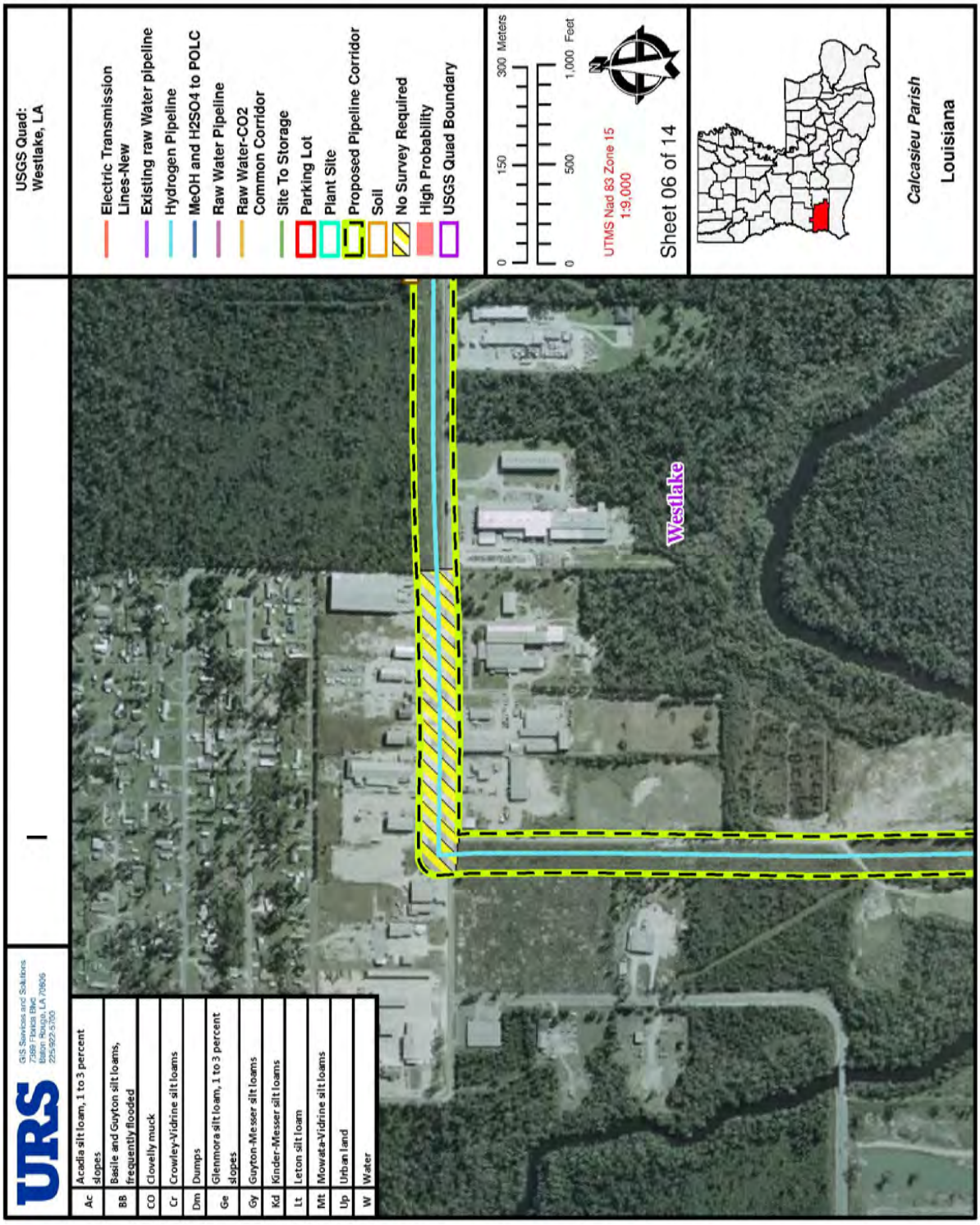


Figure 8 Soil Maps, Calcasieu Parish, Louisiana (Map 7 of 14)

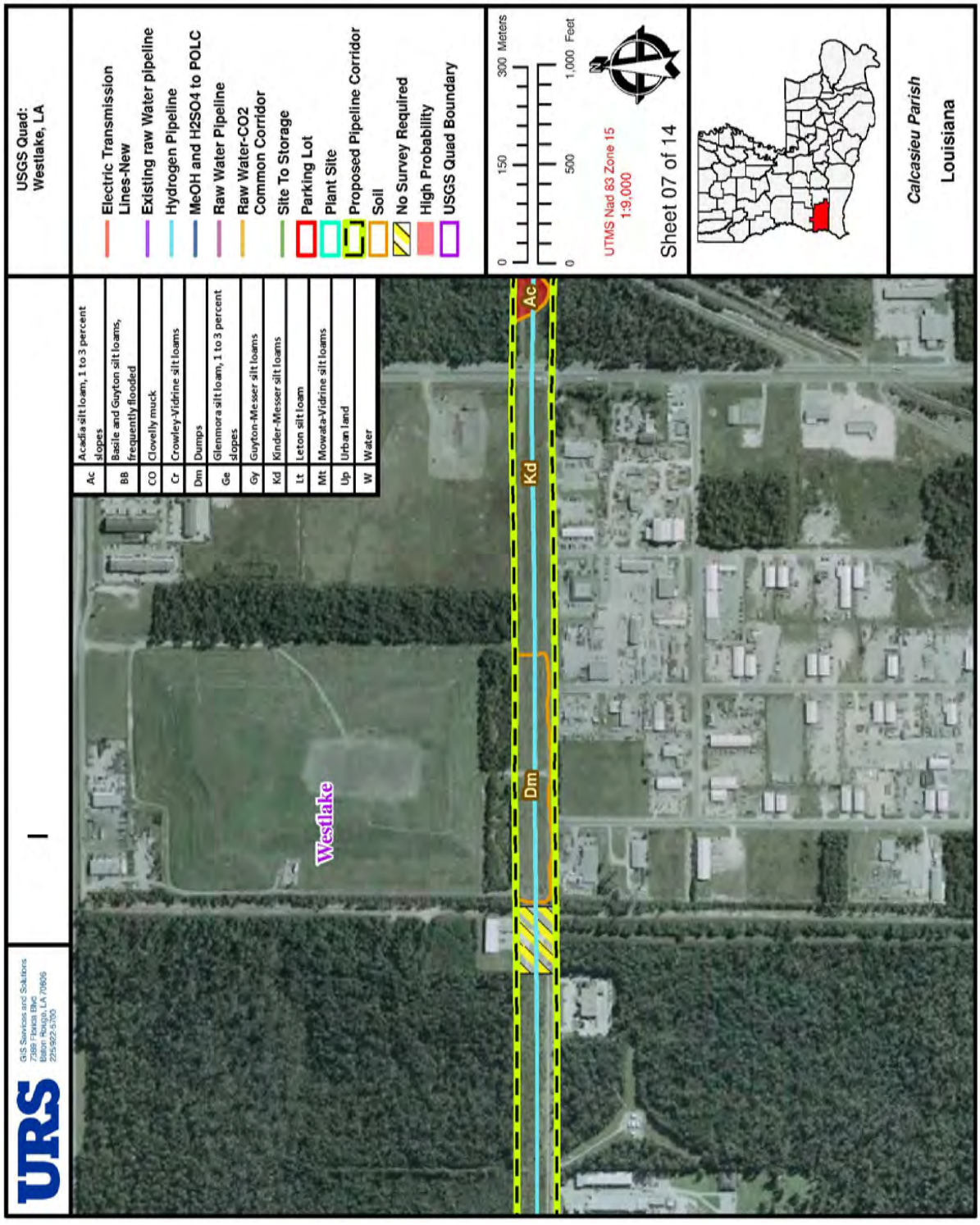


Figure 9 Soil Maps, Calcasieu Parish, Louisiana (Map 8 of 14)

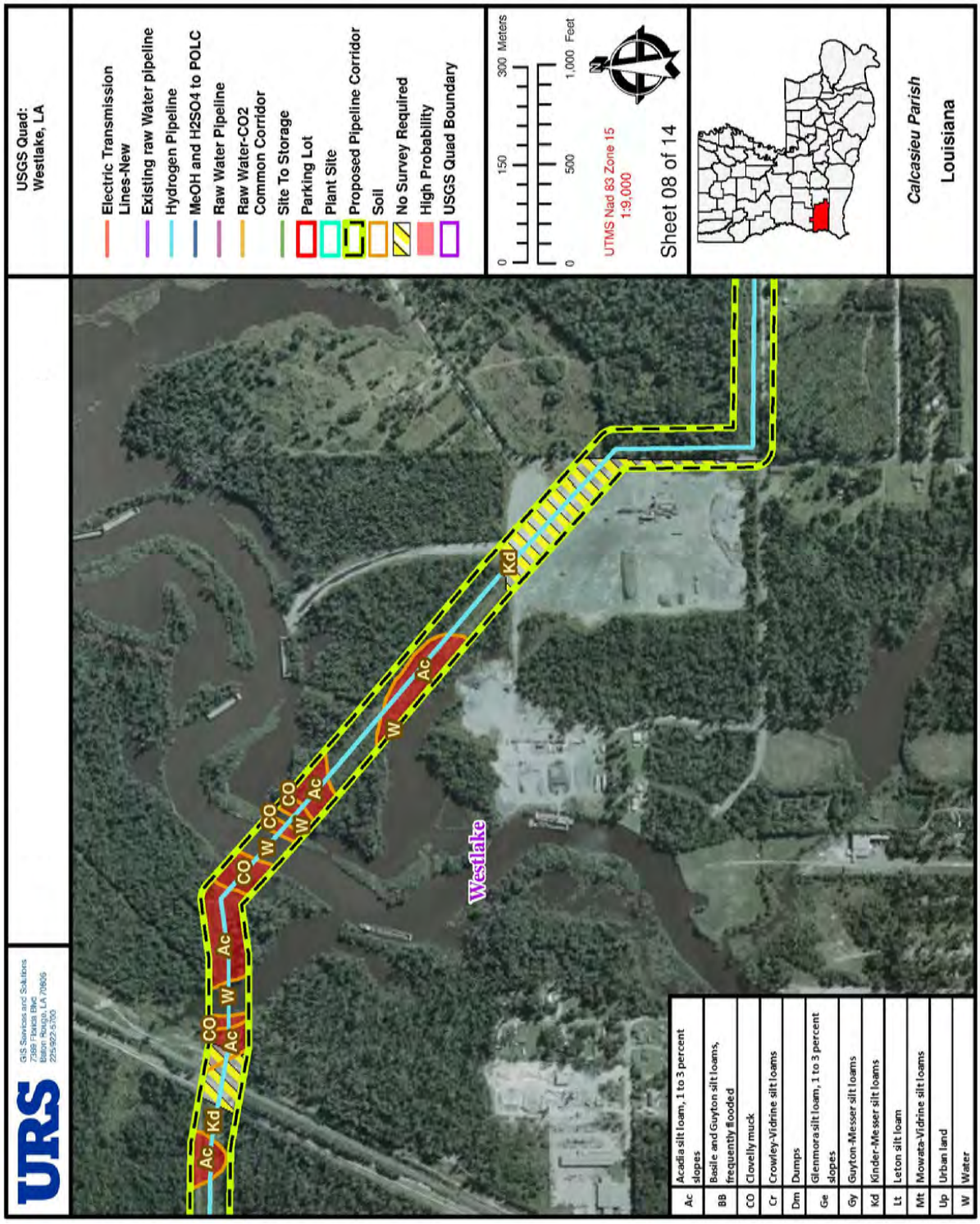


Figure 10 Soil Maps, Calcasieu Parish, Louisiana (Map 9 of 14)

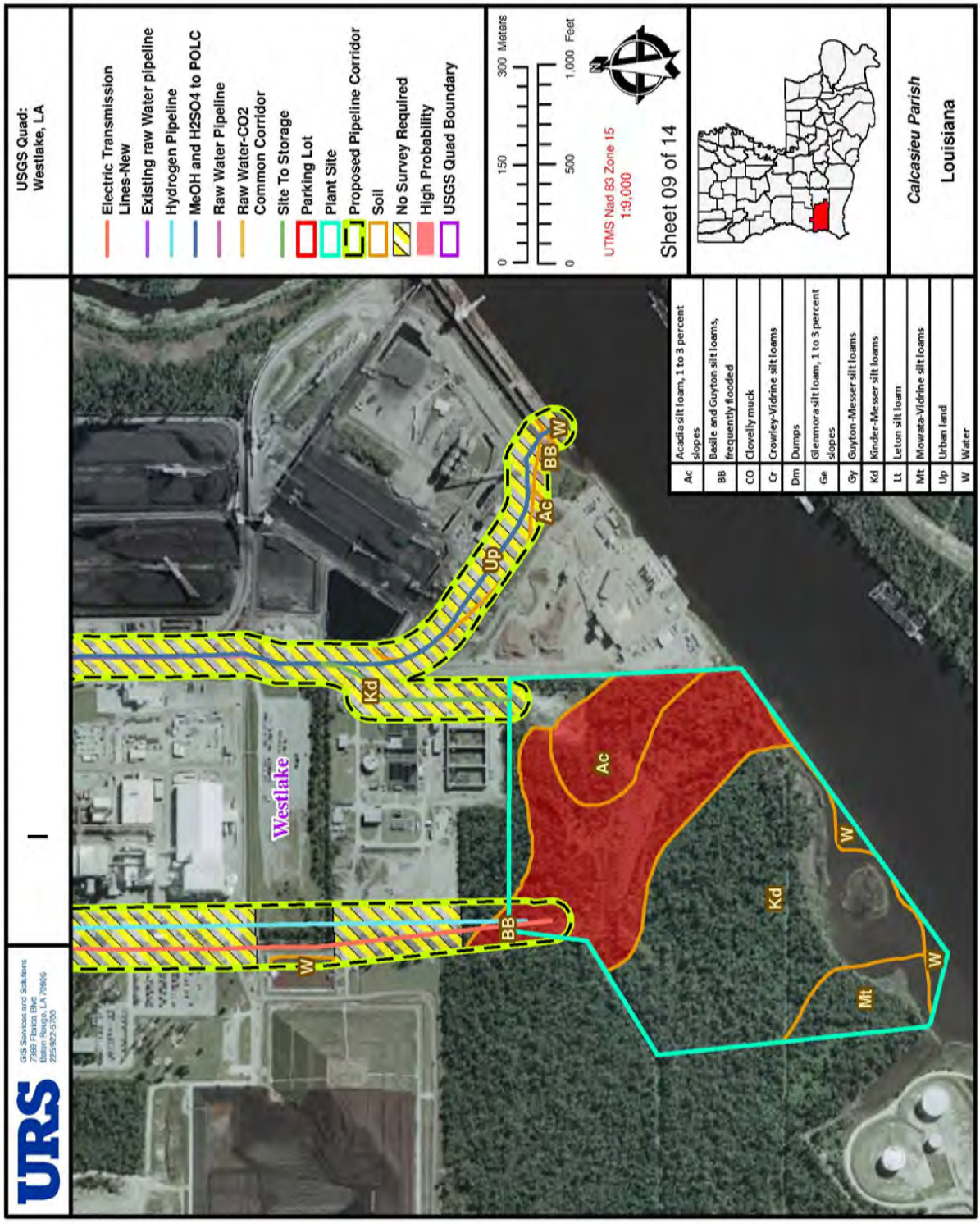


Figure 11 Soil Maps, Calcasieu Parish, Louisiana (Map 10 of 14)

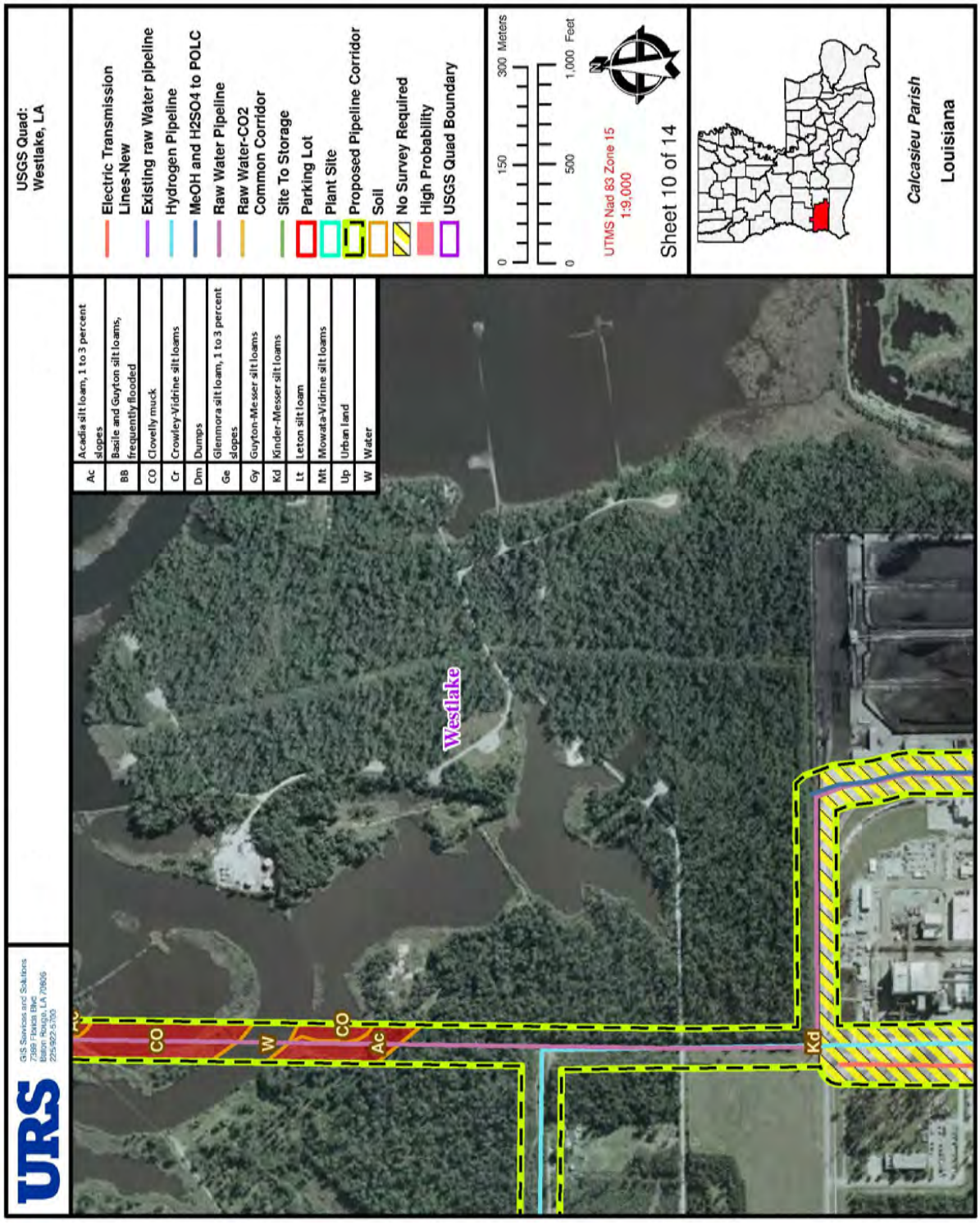


Figure 12 Soil Maps, Calcasieu Parish, Louisiana (Map 11 of 14)

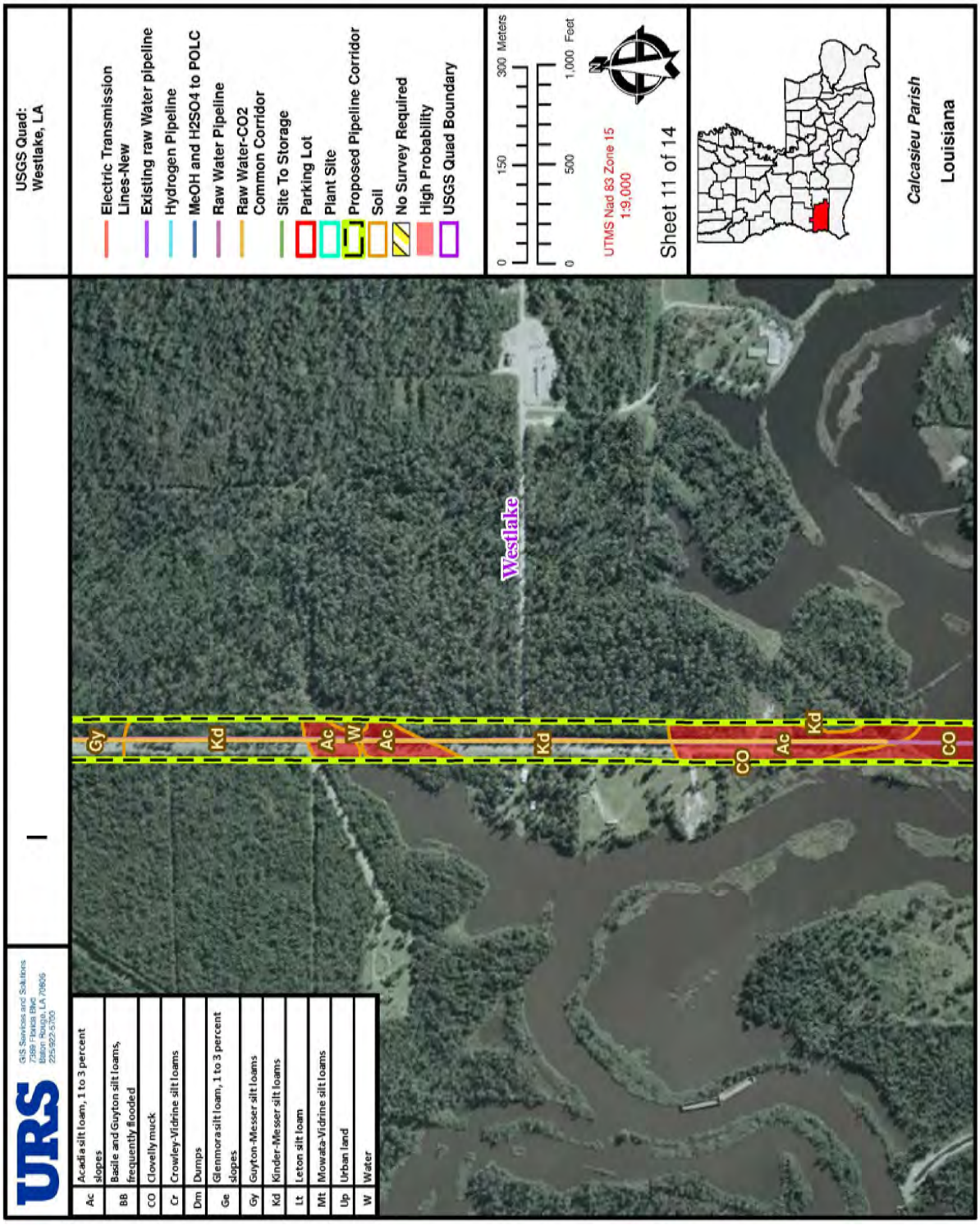


Figure 13 Soil Maps, Calcasieu Parish, Louisiana (Map 12 of 14)

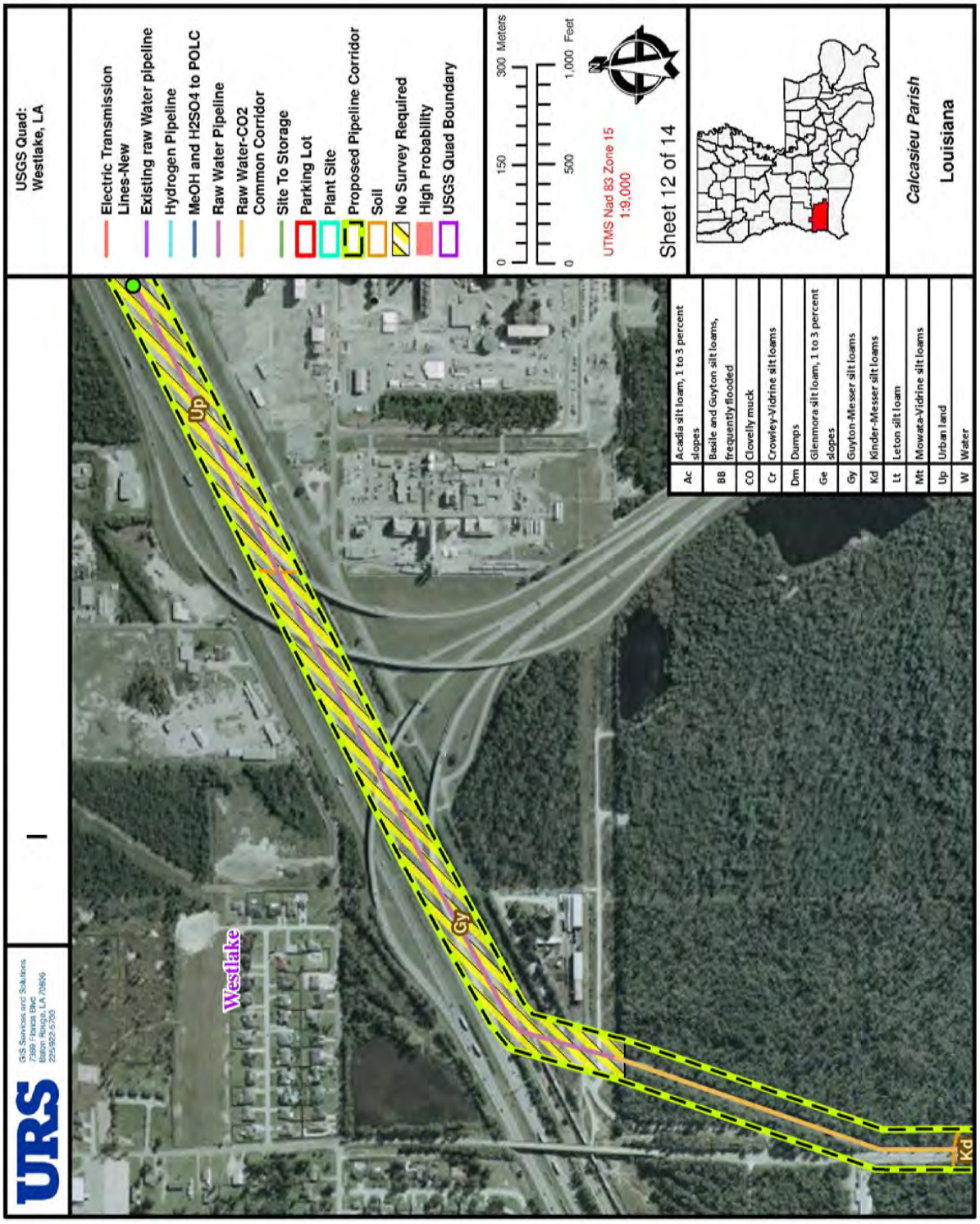


Figure 14 Soil Maps, Calcasieu Parish, Louisiana (Map 13 of 14)

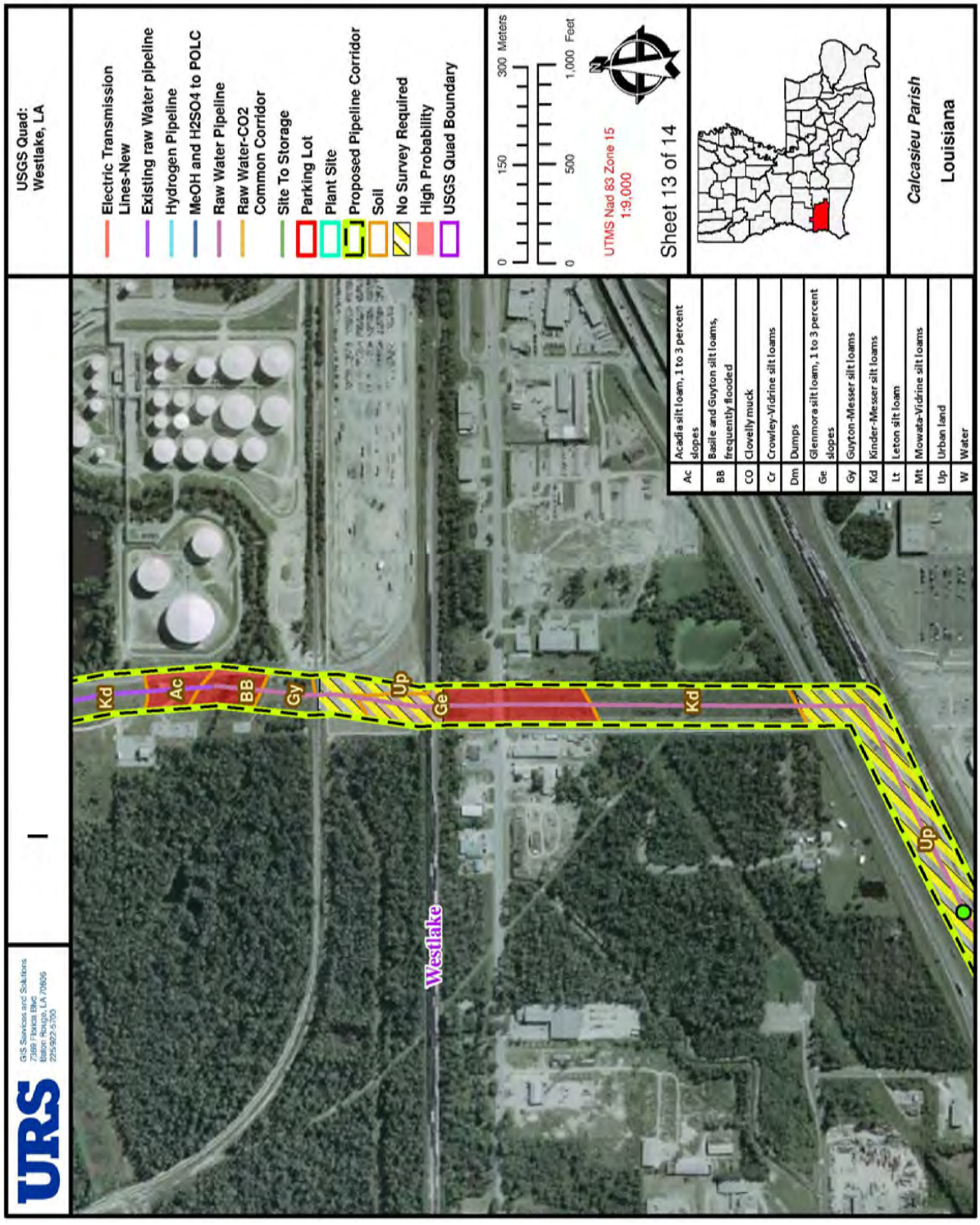
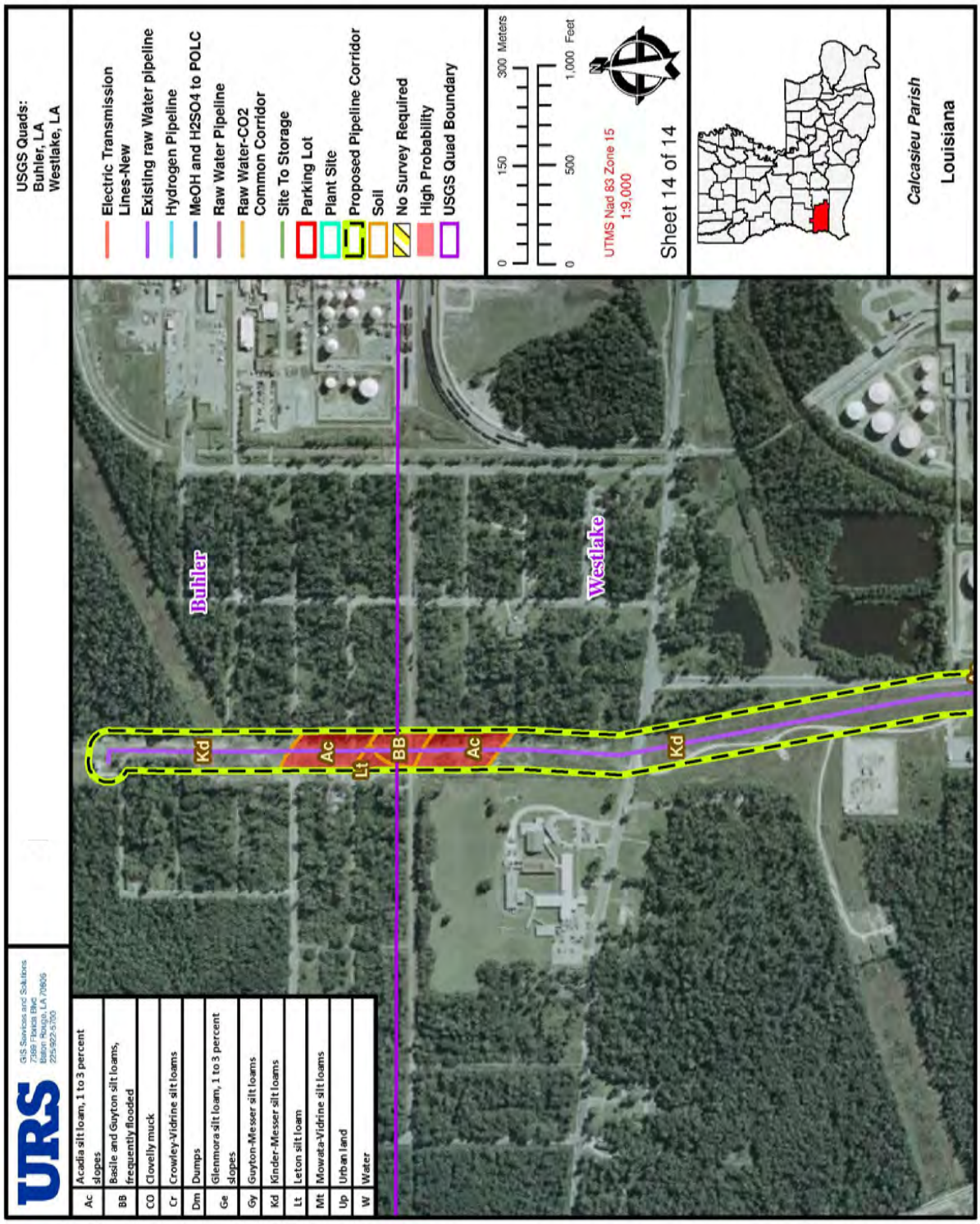


Figure 15 Soil Maps, Calcasieu Parish, Louisiana (Map 14 of 14)



Much of the survey corridor is characterized by gently sloping upland soils associated with the Gulf Coast Prairies (i.e., Crowley-Vidrine, Guyton-Messer, Kinder-Messer, and Mowata-Vidrine silt loams; 74.3%). These soils are located on flat to gently sloping, late Pleistocene alluvial, deltaic, and fluvial deposits; numerous natural circular mounds (pimple mounds) are also situated across the land surface. These landscapes have not been subject to alluvial deposition during the Holocene period (ca. 10,000 B.C. to present); therefore, archaeological cultural materials will generally be located close to the ground surface and have been subjected to natural and cultural erosional forces. This region also displays the highest degree of residential, agricultural, and industrial development; this, in concert with the shallowness of the archaeological deposits, can effectively destroy the integrity of archaeological deposits across this landscape.

The Floodplain and Stream Meander soils (i.e., Basile and Guyton; Leton) are associated mainly with the various drainages crossed by the project corridors. These soils account for approximately 9.6% of the survey area. Buried archaeological deposits are anticipated along the current and relict natural levees flanking these drainages, due to seasonal overbank flooding that used to characterize these waterways. In addition, the terrace margin deposits associated with the Acadia and Glenmora silt loams (9.0%) are also anticipated to display high archaeological site potential, as they are elevated landforms in close proximity to the drainages and floodplains. The two (2) Man-Made soils encountered in the project area (i.e., Dumps and Urban Land; 1.5%) are considered to display low archaeological site potential, based upon the level of disturbance associated with their deposition. In addition, 3.6% of the survey corridor was associated with open water bodies.

CULTURAL RESOURCES DATA COLLECTION

Calcasieu Parish lies within Management Unit III while, as defined by *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983). This management unit is defined based on common geography, culture, and economic development. Management Unit III is associated with a diverse geography, including forested uplands (north), open prairie (central), and coastal wetlands and cheniers (south) (Smith et al. 1983:61). Cultural resources background information was obtained for previously completed cultural resources surveys, previously recorded historic and prehistoric archaeological sites, historic standing structures, cemeteries, and listed National Register of Historic Places (NRHP) properties within the parish. For the purposes of this report, and as required by the Louisiana Division of Archaeology, the background review encompassed an approximately 0.5 to 1.0 mi (0.8 to 1.6 km) buffer zone surrounding the project areas. A summary of the various data sources from which information was gathered is presented below: (a) Louisiana Division of Archaeology (site forms and cultural resource surveys), located in Baton Rouge, Louisiana; (b) Louisiana Division of Historic Preservation/State Library (historic standing structures), located in Baton Rouge, Louisiana; (c) Louisiana Cultural Resources Map hosted by the Louisiana Division of Archaeology; (d) NRHP online database; and (e) the Louisiana Division of Historic Preservation National Register Website. This information provided a context for the subsequent discussions focusing on known cultural resource distributions within, and immediately adjacent to, the proposed property.

Twelve (12) Phase I cultural resources surveys have been conducted within or immediately adjacent to the proposed project areas (Table 2; Figures 15 to 20). Seven (7) of these studies were completed prior to 1994, with the remaining five (5) investigations after 2001. Five (5) of the studies were

conducted for proposed petrochemical facility footprints along the Calcasieu River, with an additional four (4) investigations associated with proposed lineal pipeline corridors. Dredging activities along the Calcasieu River accounted for two (2) cultural resources reports, while a single report dealt with the proposed access ramps associated with the I-10 and I-210 interchange.

Table 2 Cultural Resources Investigations, Calcasieu Parish, Louisiana

Report Number	Title (Author)	Results
22-0500	*Cultural Resources Survey of the I-210 and I-10 Interchange, West Ramp Modifications, Route I-220, Calcasieu Parish, Louisiana.*(Rivet 1979)	Assessed access ramps at the west terminus of the I-10, I-210 interchange just west of Lake Charles in Calcasieu Parish; no evidence of cultural material was found.
22-1168	*Cultural Resource Survey of the Proposed Bayou D'Inde Dredging and Maintenance Program, LMNOD-SA (Bayou D`Inde) 28.* (Frank 1986)	A cultural resources survey of the proposed Bayou D'Inde dredging and maintenance program was conducted, with boat, pedestrian survey, and shovel testing performed. Two previously recorded sites and four new sites were identified; four of the sites were considered potentially significant in terms of National Register criteria.
22-1325	*Cultural Resource Survey of the Proposed NL Chemicals Property, Calcasieu Parish, Lake Charles, Louisiana, WSNCo Project No. 87255* (Frank 1988)	A Phase I cultural resources survey was conducted for the proposed 40-acre NL Chemicals Property. The project area lies on the west ascending bank of the Calcasieu Ship Channel. The survey consisted of pedestrian survey and judgmental shovel-testing program on several 'pimple' mounds located in the project area. No cultural materials were recovered.
22-1501	*A Cultural Resources Survey of Two Segments of the Proposed Enron Products Pipeline, Inc.'s Cypress Pipeline Project, Cameron and Calcasieu Parishes, Louisiana.* (Price 1990)	A cultural resources survey of two segments of the proposed Enron Product's Cypress pipeline project in Cameron and Calcasieu Parishes was conducted, with boat and pedestrian survey implemented. Survey of both pipeline segments located no evidence of cultural material.
22-1505	*Level II Cultural Resources Survey of a Proposed Chlorine Pipeline, Calcasieu Parish, Louisiana* (Shuman 1990)	A Phase I cultural resources survey was conducted for a 3-mile long 6-inch diameter chlorine pipeline. No further additional cultural resources studies were recommended, but monitoring was advised for any locations that required deep drilling.
22-1573	*Cultural Resource Survey of the Proposed Kronos Louisiana, INC. Calcasieu Parish, Louisiana, WSNCo Project No. 91183* (Frank 1991)	A Phase I cultural resources survey was conducted for the proposed 110-acre Kronos Louisiana Property. The project area lies on the west ascending bank of the Calcasieu Ship Channel. The survey consisted of pedestrian survey and judgmental shovel testing on 'pimple' mounds encountered in the project area. Monitoring was recommended.
22-1783	*Cultural Resources Investigations Relative to the Proposed Sulphur Mines Salt Dome, Underground Natural Gas Storage Area, Calcasieu Parish, Louisiana* (Hahn and Weinstein 1994)	A cultural resources investigation (Phase 1) was conducted for the Proposed Sulphur Mines Salt Dome, Underground Natural Gas Storage Area, and its associated pipelines and compressor facilities in Calcasieu Parish, Louisiana. The study consisted of a reconnaissance survey of 37.13 km (23.06 mi) of a 18.29 m (60 ft) wide right-of-way and approximately 2.19 ha (5.41 ac) of various staging areas (e.g., metering stations, etc.). Two archaeological sites, one an aboriginal site (16CU27) and the other a historic industrial complex with an aboriginal component (16CU28), were discovered. Two standing structures constructed prior to 1943 were also recorded. None of the cultural resources have been recommended for inclusion in the National Register of Historic Places.

Report Number	Title (Author)	Results
22-2382	*Intensive Cultural Resources Survey Citgo Petroleum Corporation, Lake Charles Refinery, Calcasieu Parish, Louisiana* (Smith et al. 2001)	A Phase I cultural resources survey was conducted for the proposed 120-acre CITGO oil refinery. The project area lies directly west of the Calcasieu River, and at the southern extent of the Calcasieu Shipping Channel. Based on the results of the survey and site delineation, both Sites 16CU29 and 16CU30 were recommended for avoidance and additional testing of Site 16CU29 was recommended for the portions that extended to the east (outside) of their project area.
22-2498	*Phase I Cultural Resources Survey of the Proposed Hackberry LNG Terminal L.L.C. Project, Beauregard, Calcasieu and Cameron Parishes, Louisiana* (Ryan et al. 2002)	Coastal Environments, Inc., (CEI) conducted a Phase I cultural resources investigation for the Proposed Hackberry LNG Terminal L.L.C. project route through Beauregard, Calcasieu, and Cameron Parishes, Louisiana. The study consisted of a reconnaissance survey of 35.4 mi (56.95 km) of a 100 ft (30.5 m) wide right-of-way (ROW); in all approximately 233.05 ha (575.43 ac) were surveyed. Two archaeological sites, one historic house site (16CU31) and the other a historic industrial complex (16CU28), were examined during this survey. Two standing structures were also recorded.
22-2707	*A Cultural Resources Survey for the proposed Cheniere Creole Trail Pipeline, Cameron, Calcasieu, Beauregard, Jefferson Davis, Allen, and Acadia Parishes, Louisiana* (Dixon et al. 2005)	A Phase I survey of terrestrial cultural resources was conducted for the proposed Cheniere Creole Trail Pipeline in Cameron, Calcasieu, Beauregard, Jefferson Davis, Allen, and Acadia Parishes, Louisiana. The survey corridor for the pipeline measures approximately 275.4 km (171.1 mi) in length by 107 m (350 ft) in width. The fieldwork resulted in the recording of 11 new archaeological sites, 1 historic standing structure, and revisits to 2 previously recorded sites. Three prehistoric sites (16AL43, 16AL45, and 16AL46) and one historic grave site (16CU38) are recommended for avoidance. The remaining 9 sites are not considered to be eligible for listing in the National Register.
22-2988	*Phase I Cultural Resources Investigations Calcasieu River and Pass Dredged Material Management Plan Calcasieu and Cameron Parishes, Louisiana* (Ryan 2007)	Phase I cultural resources investigations were conducted for the Calcasieu River and Pass Dredged material management Plan (DMMP) in preparation by the U.S. Army Corps of Engineers (COE), New Orleans District. One archaeological site of undetermined eligibility (16CU14) was thought to be located within Disposal Area 12B. Map overlays of historic coastlines from 1955 through 2005 clearly showed that the site eroded into the River.
NA	*Field Assessment of Archaeological Site 16CU29, Lake Charles Gasification Facility, Lake Charles Cogeneration, LLC, Westlake, Calcasieu Parish, Louisiana* (Handly 2009)	A Phase I cultural resources survey was conducted within the immediate vicinity of archaeological Site 16CU29, identified previously by Smith et al. (2001:26, 36) as an intact prehistoric *Rangia* shell midden. The site appeared to extend into the southwest corner of the proposed Lake Charles Gasification Facility, Lake Charles Cogeneration, LLC, Westlake, Calcasieu Parish, Louisiana. The extensive shell midden that was previously noted was not observed during this later field investigation. It appeared that this shell midden had been eroded and/or redeposited from that portion of Site 16CU29.As a result, the site was not considered eligible for listing in the NRHP.

Ten (10) archaeological sites have been identified within 0.5 mi (0.8 km) of the proposed pipeline corridors and 1.0 mi (1.6 km) of the proposed project areas (Figures 15 to 20; Table 3); none of these sites is currently situated within the boundaries of these proposed development areas. Two (2) of the sites are located along the Calcasieu Ship Channel, with an additional seven (7) sites identified along Bayou D'Inde; a single site (16CU31) is located inland on a low terrace. Sites 16CU30, 16CU31, and 16CU73 are historic period scatters associated with the late nineteenth through mid-twentieth

centuries. The remaining seven (7) sites are prehistoric shell middens, containing large quantities of *Rangia cuneata* shell, prehistoric ceramics, and lithic tools. The cultural material associated with the majority of these prehistoric period sites (n=6) is affiliated with the Coles Creek Period in southwestern Louisiana, spanning from ca. AD 700 to 1100. The material culture found with Site 16CU29 is affiliated with slightly earlier periods; i.e., Marksville (100 BC to AD 400) and Baytown (AD 400 to 700). With regard to NRHP eligibility, five (5) sites were considered Eligible for listing; the remaining five (5) sites were considered Not Eligible for listing in the NRHP. Finally, no historic standing structures and/or listed NRHP properties are located within, or immediately adjacent to, the project areas.

Table 3 Archaeological Sites, Calcasieu Parish, Louisiana

Site Number	Site Type	Period	Location	Survey Method	NRHP Recommendations
16CU29	Shell Midden	Prehistoric (ca. 100 BC to AD 700)	Calcasieu Ship Channel	Shovel Test	Not Eligible
16CU30	Historic	Late 19th – early 20th century	Calcasieu Ship Channel	Shovel Test	Eligible
16CU31	Historic	Late 19th – Mid-20th century	Terrace	Shovel Test	Not Eligible
16CU73	Historic	Mid-20th century	Bayou D'Inde	Shovel Test	Not Eligible
16CU170	Shell Midden	Prehistoric (AD 1 to 1400)	Bayou D'Inde	Surface Collection	Not Eligible
16CU195	Shell Midden	Prehistoric (Coles Creek)	Bayou D'Inde	Shovel Test	Eligible
16CU198	Shell Midden	Prehistoric (AD 500 to 1000)	Bayou D'Inde	Surface Collection	Eligible
16CU199	Shell Midden	Prehistoric (AD 700 to 1100)	Bayou D'Inde	Surface Collection	Not Eligible
16CU200	Shell Midden	Prehistoric (AD 700 to 1100)	Bayou D'Inde	Surface Collection, Shovel Test	Eligible
16CU201	Shell Midden	Prehistoric (AD 700 to 1100)	Bayou D'Inde	Surface Collection, Shovel Test	Eligible

RESULTS AND RECOMMENDATIONS

Approximately 22% (i.e., 95 ac) of the pipeline corridors have been impacted by prior land-altering disturbance, including the installation of underground utilities (i.e., pipeline emplacement and hydro-electric transmission line corridors), industrial petrochemical complexes, and/or the construction of Interstate I-10. Portions of these proposed pipeline corridors may also have been assessed during prior cultural resources surveys. URS recommends that those areas identified as either previously disturbed (as defined above and delineated preliminarily on Figures 2 to 14) or previously surveyed, should not require any additional cultural resources investigation. Consultation should be initiated between the LCC and the Louisiana Division of Archaeology to ensure that this proposed survey methodology would be considered acceptable.

Figure 15 Previous Investigations, Calcasieu Parish, Louisiana (Map 1 of 6)

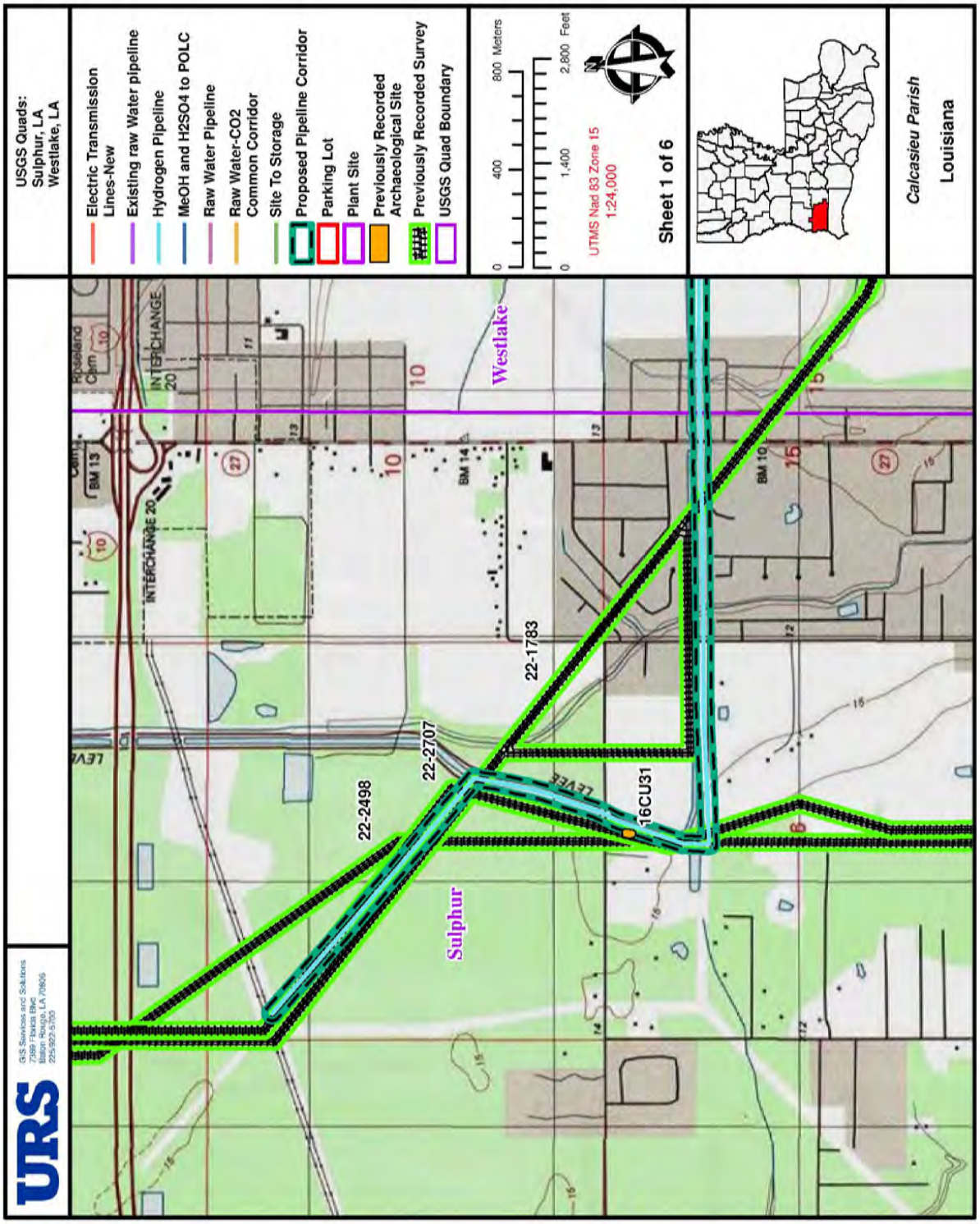


Figure 16 Previous Investigations, Calcasieu Parish, Louisiana (Map 2 of 6)

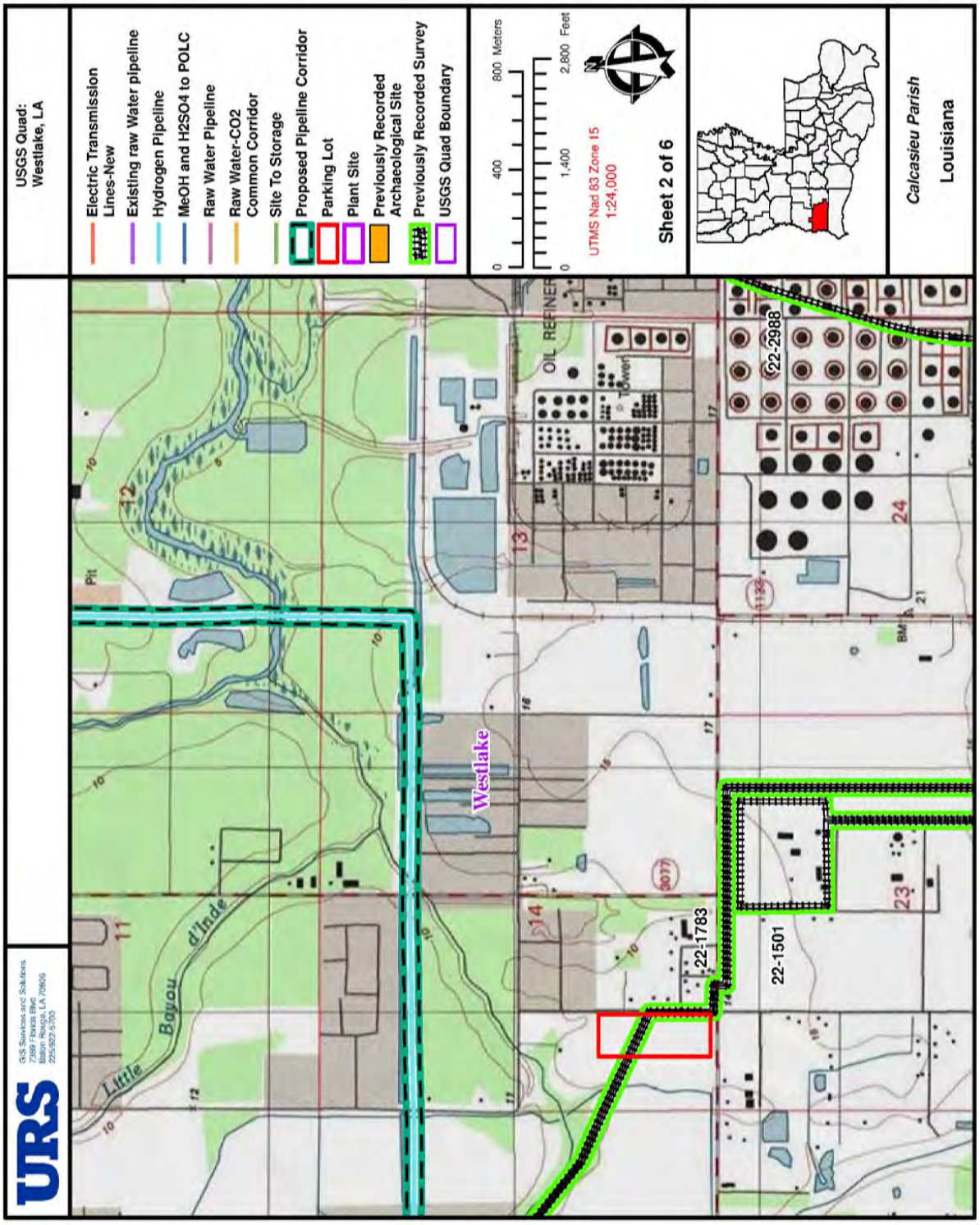


Figure 17 Previous Investigations, Calcasieu Parish, Louisiana (Map 3 of 6)

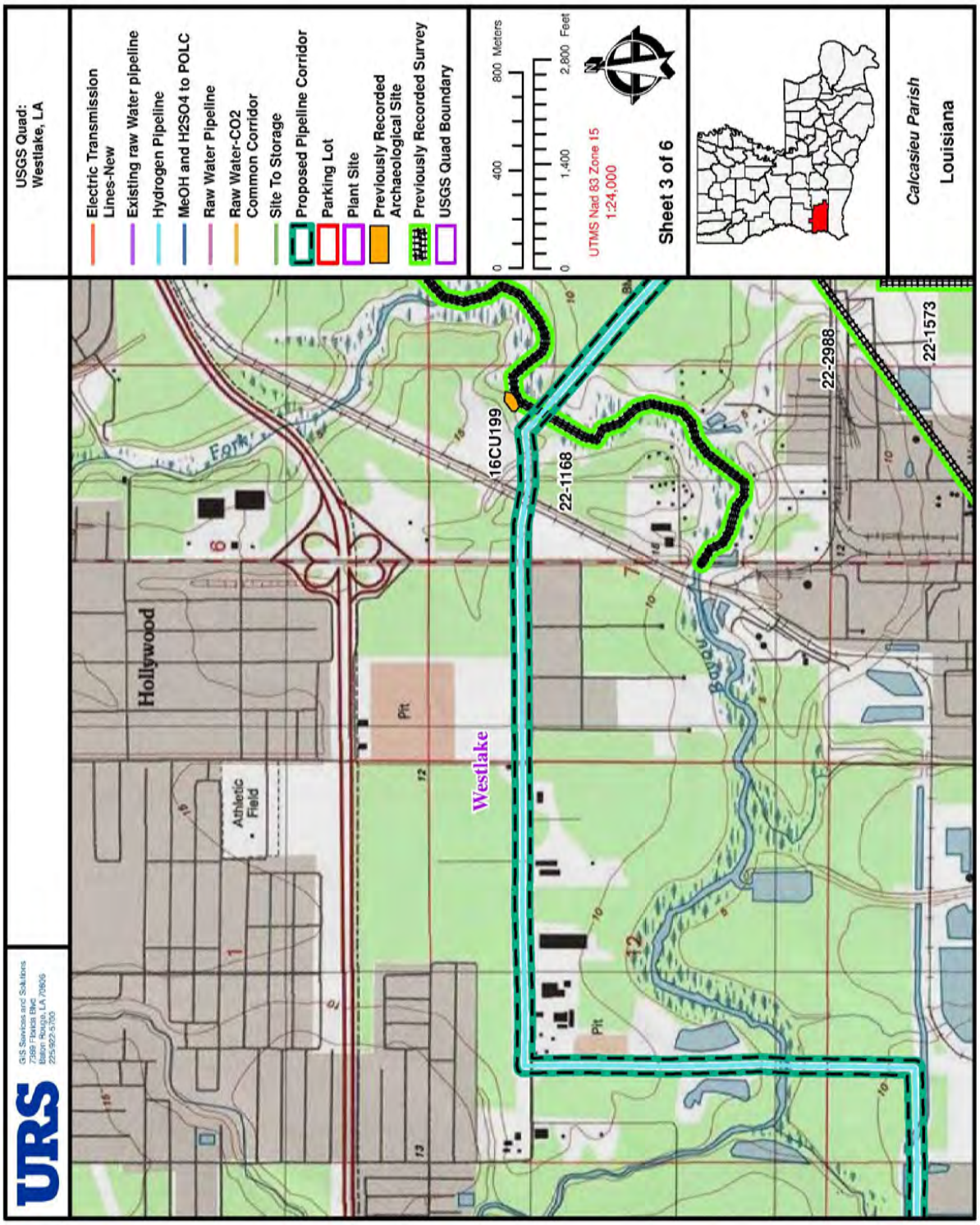


Figure 18 Previous Investigations, Calcasieu Parish, Louisiana (Map 4 of 6)

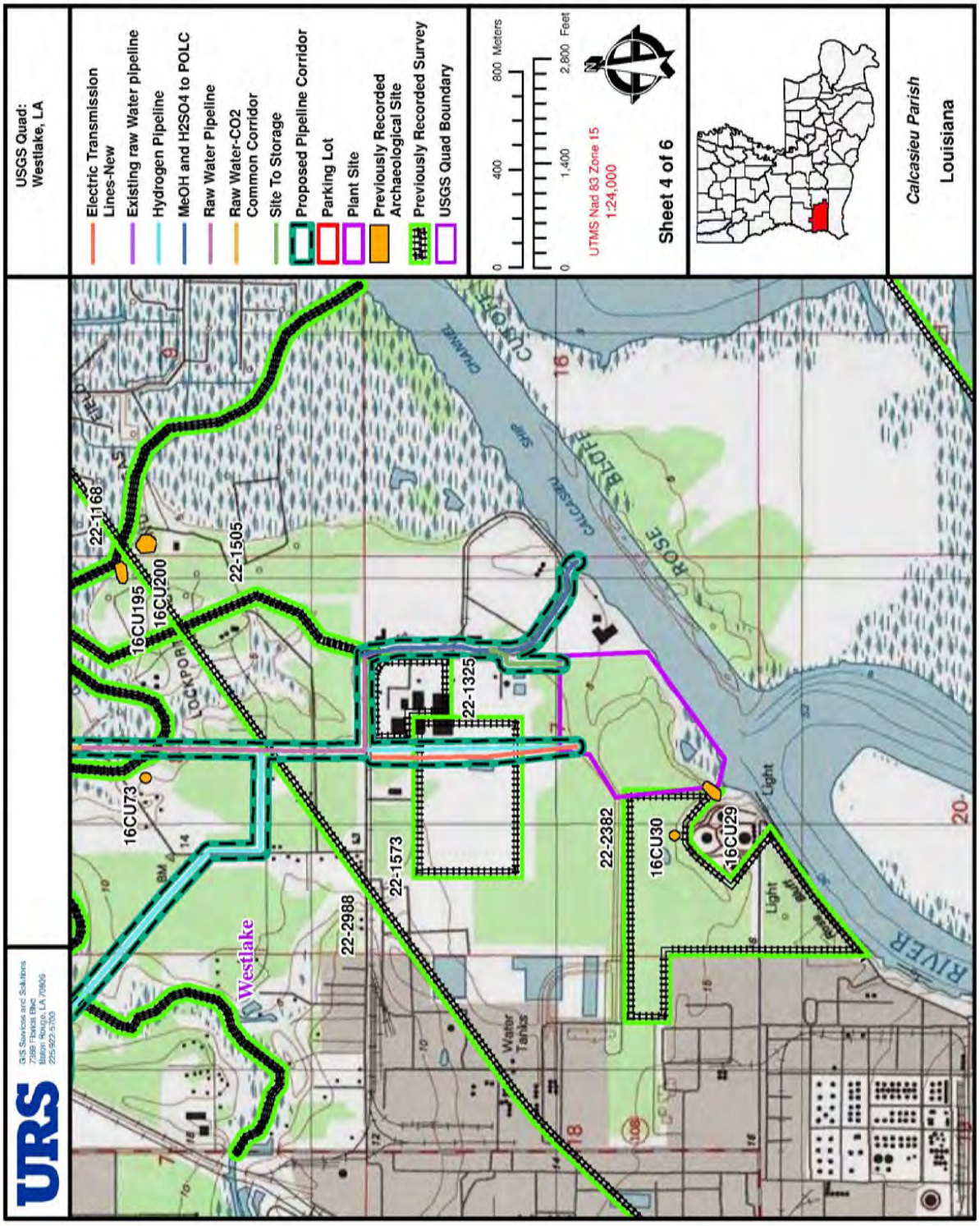


Figure 19 Previous Investigations, Calcasieu Parish, Louisiana (Map 5 of 6)

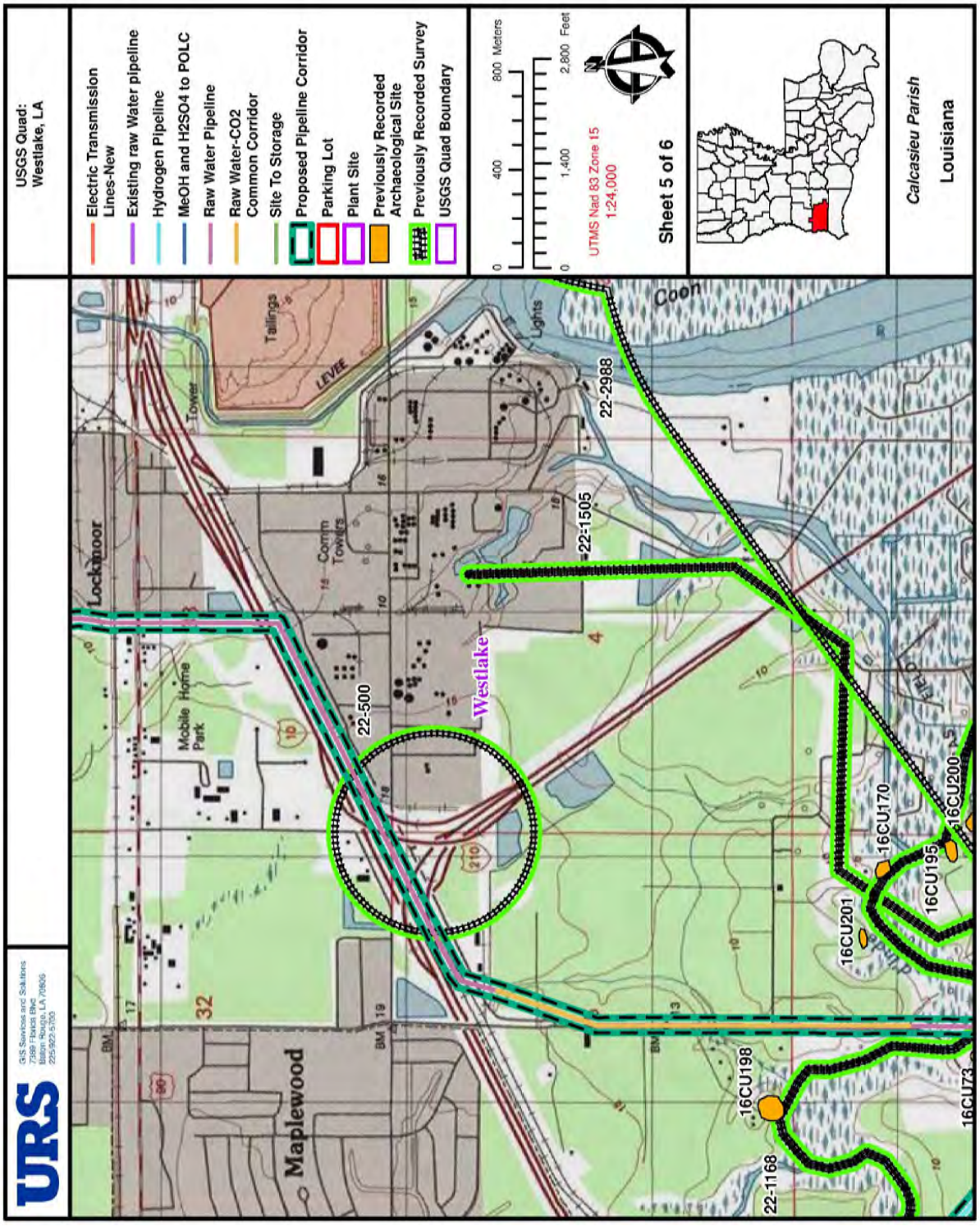
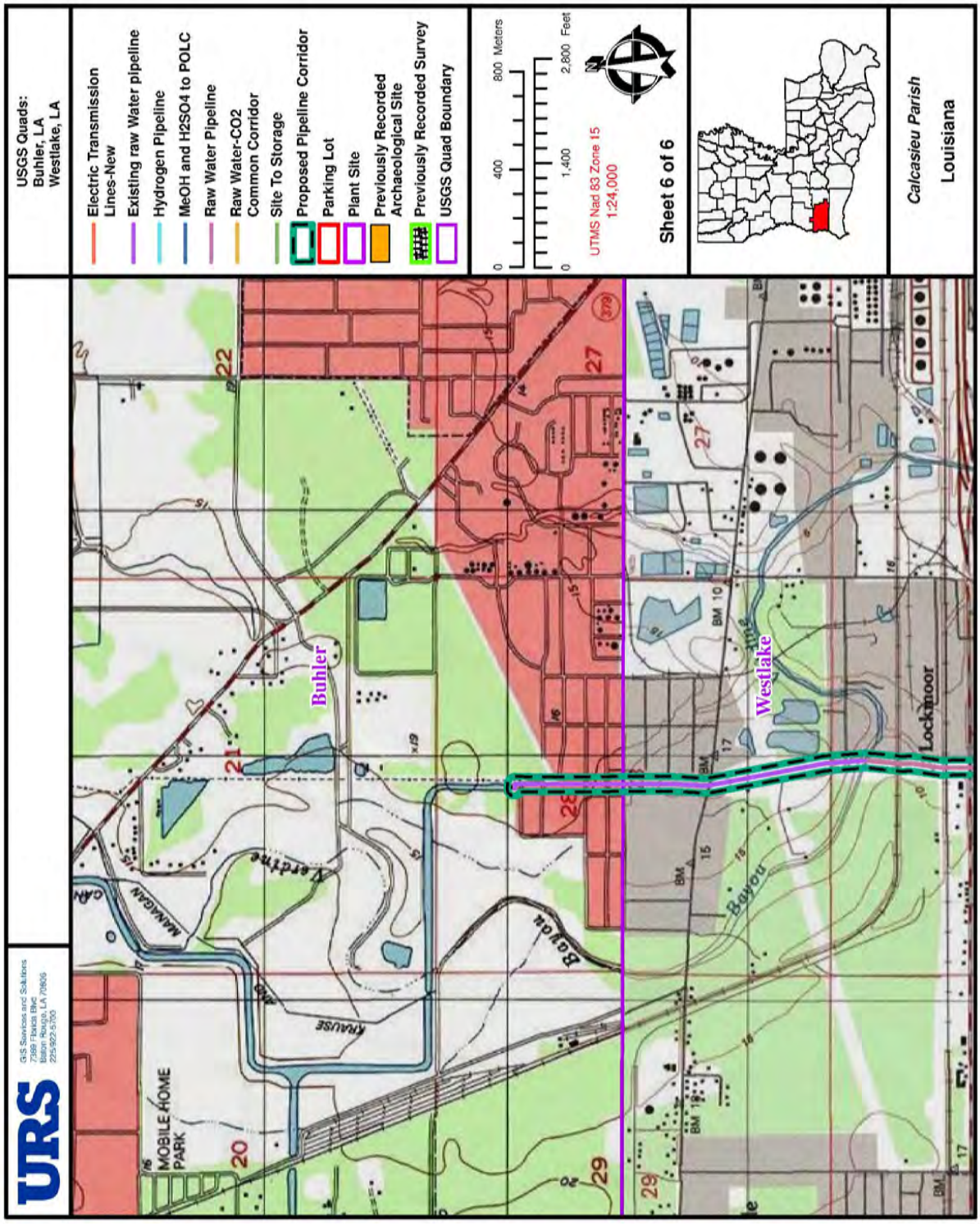


Figure 20 Previous Investigations, Calcasieu Parish, Louisiana (Map 6 of 6)



In addition, portions of the proposed parking area have been surveyed for cultural resources by Hahn and Weinstein (1994); this in combination with the prior clearing and grubbing of the parking area would indicate that the probability for identifying intact cultural resources in this area would also be considered very low. Consultation should be initiated between the LCC and the Louisiana Division of Archaeology to determine whether any further cultural resources investigation should be required for the proposed parking area.

PHASE I CULTURAL RESOURCES INVENTORY

Phase I field studies are generally the initial stage of investigation to assess whether significant above-ground (historic buildings and/or cemeteries) or below-ground (archaeological sites) cultural resources are located within the property. Each Phase I project will generally begin with a background literature search for the project area using information on file at the Louisiana State Historic Preservation Office (SHPO) and the National Register of Historic Places (NRHP); most of that information is contained within this present document. The subsequent Phase I field investigation will record any above-ground historic standing structures and also implement the appropriate subsurface testing strategies to locate any historic and/or prehistoric archaeological sites that are present.

Based on state guidelines, the Phase I cultural resources survey effort would likely entail systematic subsurface shovel testing in areas of both low and high archeological site potential. According to the recent Louisiana Division of Archaeology fieldwork guidelines, assessment must also include some level of subsurface examination. Transect survey methods would allow for the properties to be assessed in a systematic and uniform manner and assist with the identification and assessment of any cultural resources encountered during the survey effort. Any cultural resources identified during the Phase I study would need to be assessed to determine their integrity, association, and research potential. Using SHPO guidelines, delineation of the cultural resources would normally involve the excavation of additional shovel tests at 10 to (32.8 ft) intervals from an established site datum. These shovel tests continue to be excavated until two (2) negative shovel tests were encountered within the site area. All archaeological sites are then recorded on Louisiana Archeological Site Forms and submitted for a formal site number. The gathered information, in association with the subsequent analysis of the recovered cultural material, is then used to determine whether the sites should be considered eligible or not eligible in relation to the NRHP criteria for evaluation (36 CFR 60.4 [a-d]), or if it requires further study to make this determination.

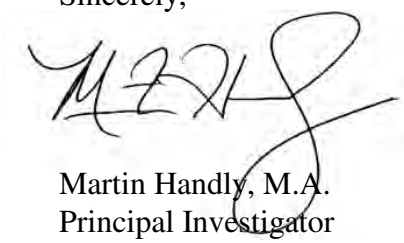
In a Phase I investigation, cultural resources staff also record all buildings and engineering elements greater than 50 years in age within or adjacent to the property boundary. The recording procedures for architectural resources follow the guidelines established by the National Park Service in their 1995 publication *National Register Bulletin 24: Guidelines for Local Survey – A Basis for Preservation Planning*. Both straight-on and corner photographs of all historic structures over approximately 50 years in age are taken, where possible. Specific information related to building materials, foundation type, structural form, architectural style, associated outbuildings and observed alterations, is collected to assess whether the property is believed eligible, not eligible, or cannot be assessed with respect to the NRHP criteria for evaluation (36 CFR 60.4 [a-d]).

REPORTING
Upon completion of any fieldwork, the state requires a Draft Report be prepared that follows the content guidelines established by the Louisiana Division of Archaeology. Two copies of the draft report are sent to the Louisiana Division of Archaeology for their review and comment. Typically, this agency has 30 days to review a Phase I report. Upon receipt and incorporation of any agency comments, and concurrence with the report findings and recommendations, final reports are prepared and submitted to the relevant agencies for curation in their libraries.

CURATION
The Louisiana Division of Archaeology requires that following the review and acceptance of the final cultural resources report, all artifacts, and copies of the records, photographs, and field notes must be curated at an acceptable public facility. The Division of Archaeology has its own facility that meets this requirement; costs for curation currently run at $200.00/cubic foot of materials.

URS thanks you for the opportunity to submit this information to your office. If you have any questions or concerns, please feel free to contact me at the numbers below.

Sincerely,



Martin Handly, M.A.
Principal Investigator
Phone: 225-231-6328
Email: martin.handly@urs.com

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Lake Charles Cogeneration LLC

Cultural Resources Assessment

Calcasieu Parish, Louisiana

URS Job. No. 10003620

July 2012

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1.0 CULTURAL RESOURCES EVALUATION

During March of 2012, URS completed a Phase IA cultural resources desktop assessment for Lake Charles Cogeneration, LLC (LCC) in association with their proposed the Lake Charles Gasification Facility (LCGF) in Calcasieu Parish, southwest Louisiana (Figure 1). The purpose of this desktop investigation was to identify any previously recorded cultural resources within a 1.0 mile (1.6 km) radius of the existing LCC facility and provide a preliminary assessment of the archaeological site potential of areas surrounding the existing facility. The desktop radius was shifted slightly to the northwest to encompass lands on the west bank of the Calcasieu Ship Channel, adjacent to the existing LCC facility, which might be suitable for the location of a proposed storage/laydown area.

This investigation followed the general guidelines and procedures outlined in *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983), the Cultural Resource Assessment standards provided by the Louisiana Division of Archaeology (2009), the National Historic Preservation Act of 1966 (as amended), the Archaeological and Historic Preservation Act of 1974, Title 36 of the Code of Federal Regulations (Parts 60-66 and 800) and *Archeology and Historic Preservation: The Secretary of the Interior's Guidelines*.

No field studies or surveys were conducted for this project; at this preliminary stage, cultural resource data collection and evaluation was conducted on a desktop basis using only existing hard copy data, internet site information, and GIS data. A summary of the various data sources from which the information was gathered is presented below:

(1) Louisiana Division of Archaeology (site forms and cultural resource surveys), located in Baton Rouge, Louisiana;
(2) Louisiana Division of Historic Preservation/State Library (historic standing structures), located in Baton Rouge, Louisiana;
(3) Louisiana Cultural Resources Map hosted by the Louisiana Division of Archaeology;
(4) National Register of Historic Places (NRHP) online database; and,
(5) Louisiana Division of Historic Preservation National Register Website.

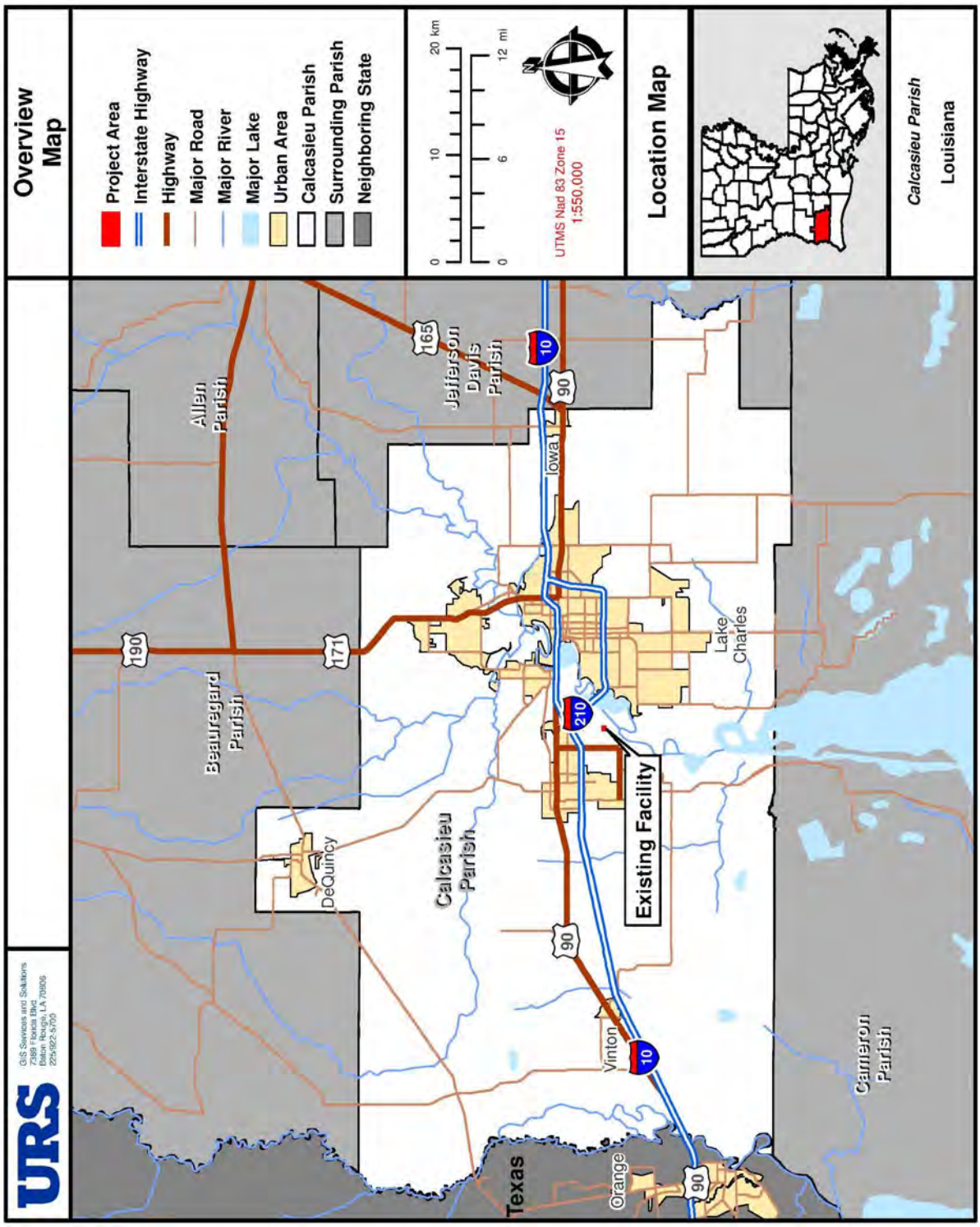
The property was assessed to provide a technical estimate to LCC concerning the expected levels of archaeological effort (i.e., Phase I cultural resources inventory, Phase II National Register evaluative testing, and/or Phase III data recovery) that may be required to receive Section 106 clearance on the property. Mr. Martin Handly (MA) served as the Principal Investigator for this project and wrote this report, while Mr. Shane Poche (BA) prepared the graphics that appear in this report.

1.1 CULTURAL RESOURCES DATA COLLECTION

Calcasieu Parish lies within Management Unit III while, as defined by *Louisiana's Comprehensive Archaeological Plan* (Smith et al. 1983). This management unit is defined based on common geography, culture, and economic development. Management Unit III is associated with a diverse geography, including forested uplands (north), open prairie (central), and coastal wetlands and cheniers (south) (Smith et al. 1983:61). Cultural resources background information was obtained for previously completed cultural resources surveys, previously recorded historic

and prehistoric archaeological sites, historic standing structures, cemeteries, and listed National Register of Historic Places (NRHP) properties within the parish.

Figure 1 Overview of LCC Property, Calcasieu Parish, Louisiana



For the purposes of this report, and as required by the Louisiana Division of Archaeology, the background review encompassed an approximately 1.0 mile (1.6 km) buffer zone surrounding the existing facility boundary (Area of Potential Effect [APE]). A summary of the various data sources from which information was gathered is presented below: (a) Louisiana Division of Archaeology (site forms and cultural resource surveys), located in Baton Rouge, Louisiana; (b) Louisiana Division of Historic Preservation/State Library (historic standing structures), located in Baton Rouge, Louisiana; (c) Louisiana Cultural Resources Map hosted by the Louisiana Division of Archaeology; (d) NRHP online database; and (e) the Louisiana Division of Historic Preservation National Register Website. This information provided a context for the subsequent discussions focusing on known cultural resource distributions within, and immediately adjacent to, the proposed property.

Four (4) cultural resources surveys have been conducted within or immediately adjacent to the existing facility (Table 1; Figure 2). Three (3) of these studies were completed prior to 1990, with the remaining investigation conducted in 2001. Three (3) of the studies were conducted for proposed petrochemical facility footprints along the Calcasieu River, with a single study associated with a lineal pipeline corridor leading to one of the facilities. All four (4) of the investigations were Phase I cultural resources survey efforts.

Table 1 Cultural Resources Investigations, LCC Property, Calcasieu Parish, Louisiana

Report Number	Title (Author)	Results
22-1325	*Cultural Resource Survey of the Proposed NL Chemicals Property, Calcasieu Parish, Lake Charles, Louisiana, WSNCo Project No. 87255* (Frank 1988)	A Phase I cultural resources survey was conducted for the proposed 40-acre NL Chemicals Property. The project area lies on the west ascending bank of the Calcasieu Ship Channel. The survey consisted of pedestrian survey and judgmental shovel-testing program on several 'pimple' mounds located in the project area. No cultural materials were recovered.
22-1505	*Level II Cultural Resources Survey of a Proposed Chlorine Pipeline, Calcasieu Parish, Louisiana* (Shuman 1990)	A Phase I cultural resources survey was conducted for a 3-mile long 6-inch diameter chlorine pipeline. No further additional cultural resources studies were recommended, but monitoring was advised for any locations that required deep drilling.
22-1573	*Cultural Resource Survey of the Proposed Kronos Louisiana, INC. Calcasieu Parish, Louisiana, WSNCo Project No. 91183* (Frank 1991)	A Phase I cultural resources survey was conducted for the proposed 110-acre Kronos Louisiana Property. The project area lies on the west ascending bank of the Calcasieu Ship Channel. The survey consisted of pedestrian survey and judgmental shovel testing on 'pimple' mounds encountered in the project area. Monitoring was recommended, but no cultural materials were recovered.
22-2382	*Intensive Cultural Resources Survey Citgo Petroleum Corporation, Lake Charles Refinery, Calcasieu Parish, Louisiana* (Smith et al. 2001)	A Phase I cultural resources survey was conducted for the proposed 120-acre CITGO oil refinery. The project area lies directly west of the Calcasieu River, and at the southern extent of the Calcasieu Shipping Channel. Based on the results of the survey and site delineation, both Sites 16CU29 and 16CU30 were recommended for avoidance and additional testing of Site 16CU29 was recommended for the portions that extended to the east (outside) of their project area.

Nine (9) archaeological sites have been identified within 1.0 mi (1.6 km) of the existing facility (Figure 2; Table 2). Two (2) of the sites are located along the Calcasieu Ship Channel, with the remainder identified along Bayou D'Inde, to the north of the existing facility. Sites 16CU30 and 16CU73 are both historic period scatters associated with the late nineteenth through mid-twentieth centuries. The remaining seven (7) sites are prehistoric shell middens, containing large quantities of *Rangia cuneata* shell, prehistoric ceramics, and lithic tools. The cultural material associated with the majority of these prehistoric period sites (n=6) is affiliated with the Coles Creek Period in southwestern Louisiana, spanning from ca. AD 700 to 1100. The material culture found with Site 16CU29 is affiliated with slightly earlier periods; i.e., Marksville (100 BC to AD 400) and Baytown (AD 400 to 700). With regard to NRHP eligibility, five (5) sites were considered Eligible for listing; the remaining four (4) sites were considered Not Eligible for listing in the NRHP. Finally, no historic standing structures, cemeteries, and/or listed NRHP properties are located within, or immediately adjacent to, the project property.

Table 2 Archaeological Sites, LCC Property, Calcasieu Parish, Louisiana

Site Number	Site Type	Period	Location	Survey Method	NRHP Recommendations
16CU29	Shell Midden	Prehistoric (ca. 100 BC to AD 700)	Calcasieu Ship Channel	Shovel Test	Not Eligible
16CU30	Historic	Late 19th–early 20th century	Calcasieu Ship Channel	Shovel Test	Eligible
16CU73	Historic	Mid-20th century	Bayou D'Inde	Shovel Test	Not Eligible
16CU170	Shell Midden	Prehistoric (AD 1 to 1400)	Bayou D'Inde	Surface Collection	Not Eligible
16CU195	Shell Midden	Prehistoric (Coles Creek)	Bayou D'Inde	Shovel Test	Eligible
16CU198	Shell Midden	Prehistoric (AD 500 to 1000)	Bayou D'Inde	Surface Collection	Eligible
16CU199	Shell Midden	Prehistoric (AD 700 to 1100)	Bayou D'Inde	Surface Collection	Not Eligible
16CU200	Shell Midden	Prehistoric (AD 700 to 1100)	Bayou D'Inde	Surface Collection, Shovel Test	Eligible
16CU201	Shell Midden	Prehistoric (AD 700 to 1100)	Bayou D'Inde	Surface Collection, Shovel Test	Eligible

Currently, the area surrounding the existing facility is a mix of coastal marsh, woodland, and industrial facilities. Of the nine previously identified archaeological sites, seven are situated on stream terrace soils affiliated with the Acadia silt loam (Table 3). These elevated terrace margins are located adjacent to waterbodies, such as Bayou D'Inde, and considered to display higher archaeological site potential. This drainage is where five of the prehistoric shell midden sites and two of the historic period sites were identified.

The Clovelly Muck is associated with predominantly inundated brackish waters found in coastal marshes. Overall, these soils are anticipated to display lower archaeological site potential; however, two previously recorded prehistoric shell midden sites (i.e., 16CU170 and 16CU198) were associated with this soil type within the study area.

Figure 2 Previous Investigations, LCC Property, Calcasieu Parish, Louisiana

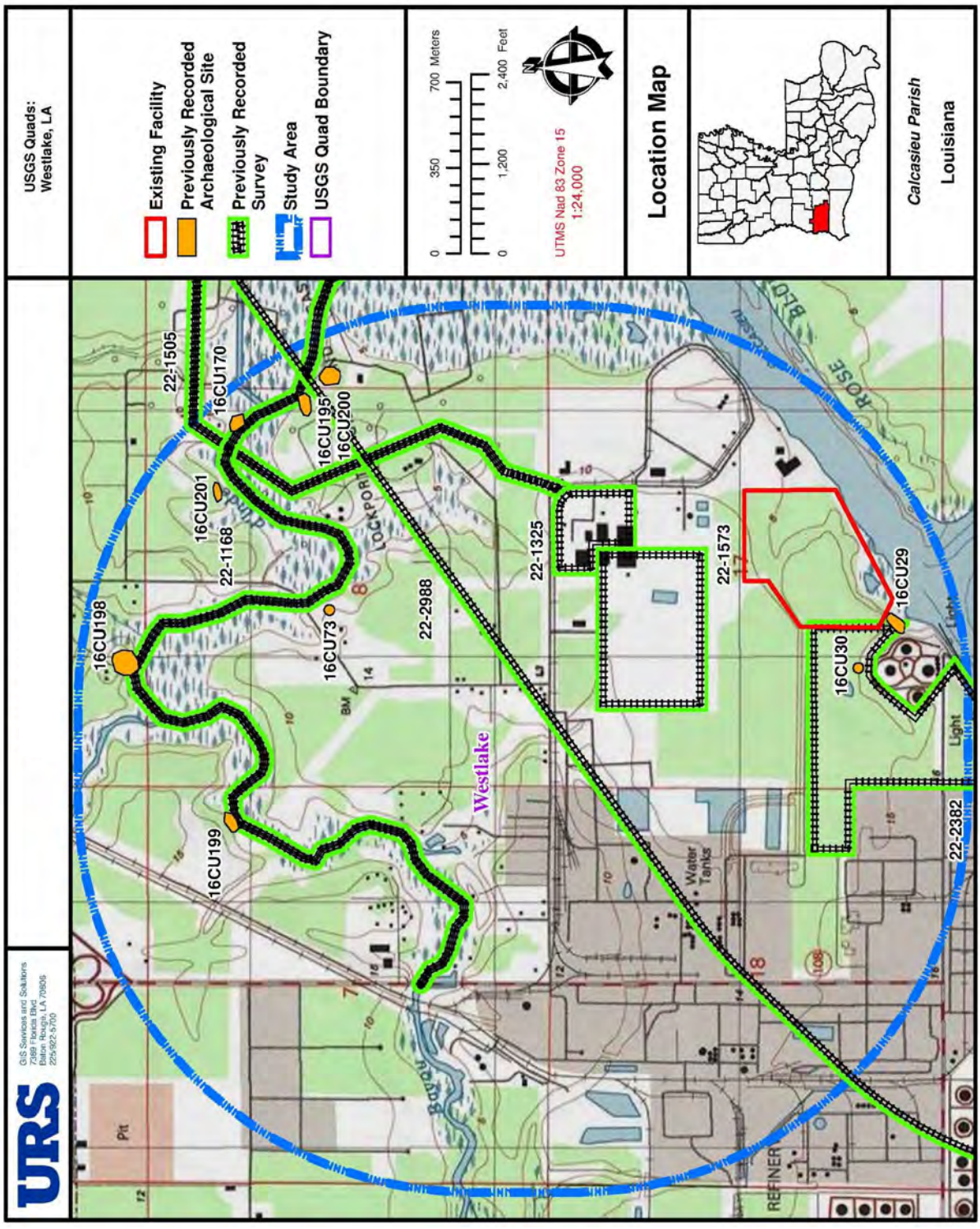


Table 3 Archaeological Site Locations and Associated Soils, LCC Property, Calcasieu Parish, Louisiana

Archaeological Sites	Landform	Soil Name	Drainage	Slope (%)	Archaeological Potential
16CU170 16CU198	Coastal Marsh	Clovelly muck	Very Poorly Draining	0	Low
16CU29 16CU30 16CU73 16CU195 16CU199 16CU200 16CU201	Stream Terrace	Acadia silt loam	Somewhat poorly	1-3	High

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Enclosure 6

List of Federally Recognized Indian Tribes for the portions of the
Proposed Lake Charles CCS Project and LCCE Gasification Project in Calcasieu Parish,
Louisiana

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List of Federally Recognized Indian Tribes with a Potential Interest in the proposed Lake Charles CCS Project and LCCE Gasification Project in Calcasieu Parish, Louisiana

Federally-recognized Indian Tribe	Potential Interest
Chitimacha Tribe of Louisiana	Located in Louisiana
Coushatta Tribe of Louisiana	Located in Louisiana
Jena Band of Choctaw Indians	Located in Louisiana
Tunica-Biloxi Tribe of Louisiana	Located in Louisiana
Alabama Coushatta Tribe of Texas	Located in Texas, but identified as a tribe with historical interest in parts of Louisiana by the Louisiana CRT
Caddo Nation	Located in Oklahoma, but identified as a tribe with historical interest in parts of Louisiana by the Louisiana CRT
Mississippi Band of Choctaw Indians	Located in Mississippi, but identified as a tribe with historical interest in parts of Louisiana by the Louisiana CRT
Quapaw Tribe of Oklahoma	Located in Oklahoma, but identified as a tribe with historical interest in parts of Louisiana by the Louisiana CRT
Choctaw Nation of Oklahoma	Located in Oklahoma, but identified as a tribe with historical interest in parts of Louisiana by the Louisiana CRT
Seminole Nation of Oklahoma	Located in Oklahoma, but identified as a tribe with historical interest in parts of Louisiana by the Louisiana CRT
Seminole Tribe of Florida	Located in Florida, but identified as a tribe with historical interest in parts of Louisiana by the Louisiana CRT

Sources: Louisiana CRT 2011b, BIA 2011; NPS 2011c, 2011d, 2011e, 2011f; Sturtevant 1967.

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JAY DARDENNE
LIEUTENANT GOVERNOR

State of Louisiana

OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT
DIVISION OF ARCHAEOLOGY

CHARLES R. DAVIS
DEPUTY SECRETARY

PAM BREAUX
ASSISTANT SECRETARY

January 24, 2013

Ms. Janine Whitken
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, New York 14086

Re: Lake Charles Carbon Capture and Sequestration (CCS) Project
APE, Phase IA Cultural Resources Investigations, an Cultural Resources
Calcasieu Parish, Louisiana

Dear Ms. Whitken:

This in response to your submission dated August 15, 2012, concerning the above-referenced project. We have reviewed the enclosed documentation and concur with the proposed Area of Potential Effect. Furthermore, we have reviewed the Phase IA cultural Resources Report for the Proposed LCCE Gasification Project Offsite Facilities. We agree with the recommendation of the archaeologists that previously surveyed areas or areas that have been identified as distributed do require any further investigation.

For the remaining areas, we agree that the field methodology outlined in the report is an appropriate measure to identify any potential historic properties. We agree with the high probability areas determination and those areas should be surveyed as such. The remaining areas will be surveyed at our low probability standards. We look forward to reviewing the report upon completion of the field work. If you have any questions, please contact Rachel Watson in the Division of Archaeology at (225)342-8165 or rwatson@crt.la.gov.

Sincerely,

Pam Breaux

Pam Breaux
State Historic Preservation Officer

PB:RW:s

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NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA

U.S. DEPARTMENT OF ENERGY

August 15, 2012

Mr. Mark Wolfe
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Brazoria County, Texas (and Calcasieu Parish, Louisiana)

Dear Mr. Wolfe:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, the DOE is consulting with the Texas Historical Commission on the proposed project.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, in Brazoria County, Texas. Please note that as of June 1, 2012, the name of Lake Charles Cogeneration, LLC was changed to Lake Charles Clean Energy, LLC. Historical references to Lake Charles Cogeneration (LCC) Gasification are now LCCE Gasification.

During the DOE demonstration phase of the proposed project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, and transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation.

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A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field during the demonstration period.

As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the Lake Charles CCS Project and its associated CO_2 capture and compression facilities in Calcasieu Parish, Louisiana;
- the Lake Charles CCS Project proposed 11.1 mile CO_2 pipeline in Calcasieu Parish Louisiana;
- Lake Charles CCS Project proposed Research Monitoring, Verification, Analysis (MVA) program for the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation in Brazoria County, Texas; and
- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (connected action).

DOE has determined that the area of potential effects (APE) for the undertaking will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCCE Gasification, which are located in Calcasieu Parish, Louisiana and in Brazoria County, Texas. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Texas includes the location of the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation and Research MVA program at the existing Hastings Oil Field in Brazoria County, Texas (see Enclosure 2).

The APE in Calcasieu Parish, Louisiana includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area (see Enclosure 2).
- the proposed new 11.1-mile long CO_2 pipeline transporting CO_2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline (to the southwest).

In October 2011, William Self Associates, Inc. (WSA) conducted a records and literature search of the area within the Research MVA portion of the APE for the proposed action (Karbula 2011). The results of this records and literature search were sent to your office on October 25, 2011 and are included in Enclosure 3. The purpose of the records and literature search by WSA was to determine the presence of previously identified cultural resources and historic properties within the Research MVA portion of the APE; to determine the extent of previous and existing disturbance

and development within the Research MVA portion of the APE; and to evaluate the potential sensitivity of the Research MVA portion of the APE for unidentified cultural resources or historic properties. Results of the records and literature search by WSA indicated that there are no recorded archaeological sites, cemeteries, NRHP properties, State Archaeological Landmarks (SAL) or markers within the Research MVA portion of the APE. Because the Hastings Oil Field is a highly disturbed landscape resulting from decades of exploration for oil and characterized by the presence of numerous oil companies' pipelines, wells and support infrastructure, the potential for intact undisturbed soil profiles with archaeological sensitivity within the Research MVA portion of the APE is limited, if not entirely absent (Karbula 2011).

As a result of the records and literature search, WSA recommended that the Research MVA portion of the APE has a low probability for containing NRHP-eligible historic properties and that no archeological survey of the Research MVA areas is needed for the Proposed Action (Karbula 2011). The Texas State Historic Preservation Officer (SHPO) concurred that the Research MVA area has a very low probability for containing NRHP-eligible properties and/or for formal designation as an SAL, and indicated that the Research MVA portion of the Proposed Action may proceed without consultation with the Texas SHPO, provided that no significant archaeological deposits are encountered during development activities within the Research MVA area (Wolfe 2011). Documentation of the previous consultation between WSA and your office regarding the results of the records and literature search and archaeological sensitivity assessment for the APE in Brazoria County is in Enclosure 3.

DOE is not aware of any other previously conducted cultural resources investigations in the portion of the APE in Brazoria County, Texas (i.e., at the location of the proposed Hasting injection site and Research MVA program at the existing Hastings Oil Field). DOE confirmed that no NRHP-listed historic properties or districts, neighborhood surveys, historical markers, cemeteries, museums, historic county courthouses, military sites, or SALs that are buildings are within the APE or a 0.5 mile radius around the APE in Brazoria County, Texas (NPS 2011a, 2011b; Texas Historical Commission [THC] 2011).

In accordance with Section 106 of the NHPA, DOE is writing to seek your concurrence on the proposed project's APE in Texas per 36 CFR 800.4(a)(1). DOE is also seeking your concurrence with DOE's proposed determination of no historic properties affected for the proposed project under 36 CFR 800.4(d)(1), based on the results of the records and literature search by WSA and the conclusions included in correspondence between your office and WSA.

DOE has identified three federally recognized Indian Tribes with a potential interest in the portions of the proposed project in Texas (see Enclosure 4) and is also seeking information from your office for any other parties that may have an interest in the Section 106 consultation process for the proposed project in accordance with 36 CFR 800.3(f). Additionally, DOE would appreciate your assistance with the identification of any additional issues or concerns regarding cultural resources or historic properties in Texas that may be affected by the proposed project. DOE is conducting separate consultation with the Louisiana SHPO and federally recognized Indian Tribes and other consulting parties for the proposed new facilities in Calcasieu Parish, Louisiana.

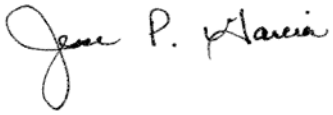
DOE looks forward to receiving your concurrence with the APE and the determination of effects on historic properties for the portion of the proposed project that is in Brazoria County, Texas, and your comments on any issues or concerns for cultural resources or historic properties that might be

affected by the proposed project or on any other parties that may have an interest in the Section 106 consultation for the proposed project. Please forward the results of your review and any requests for additional information to our contractor:

Janine Whitken
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, New York 14086
(716) 684-8060 extension 2745
JWhitken@ene.com

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Brazoria County, Texas
3. Previous correspondence with the THC/Texas SHPO for the Hastings injection site and MVA
4. List of federally recognized Indian tribes

References Cited

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Karbula, James W., Ph.D. 2011. Letter dated October 25, 2011, from Dr. James W. Karbula, Regional Project Director, William Self Associates, Inc., Austin, Texas, to Patricia Mercado-Allinger, State Archaeologist, Archeology Division, Texas Historical Commission, Austin, Texas. Re: *Denbury Onshore, LLC, CO2 Sequestration Monitoring, Verification, and Accounting (MVA), Hastings Field, Brazoria County, Texas*.

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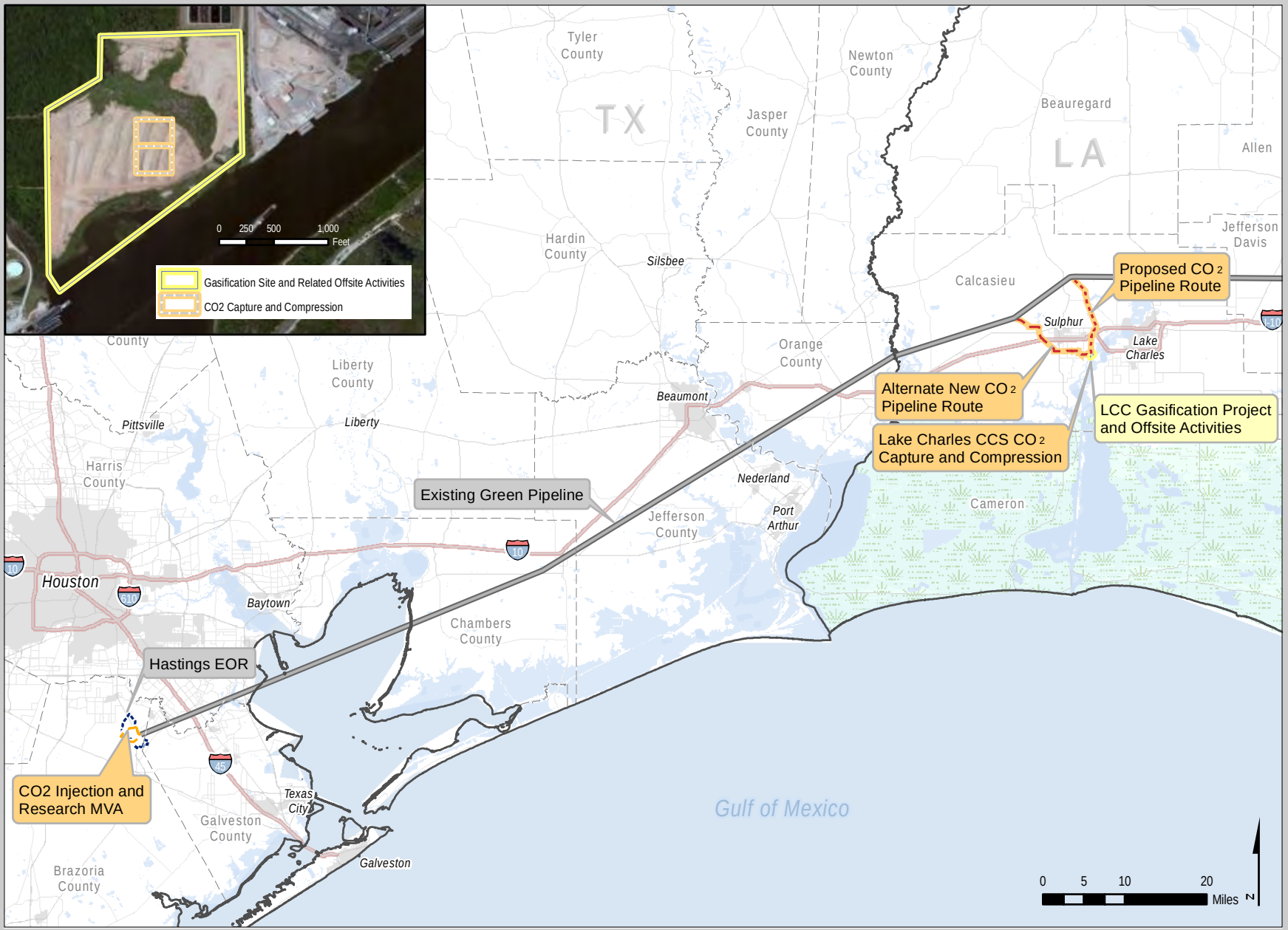
Wolfe, Mark. 2011. Letter dated November 1, 2011, from Mark Wolfe, State Historic Preservation Officer, Texas Historical Commission, Austin, Texas, to James Karbula, William Self Associates, Inc., Austin, Texas. Re: *Project Review under Section 106 of the National Historic Preservation act of 1966 and the Antiquities Code of Texas, Denbury Onshore, LLC, CO2 Sequestration Monitoring, Verification, and Accounting (MVA), Hastings Field, Brazoria County, Texas*.

Enclosure 1

Location of the Proposed
Lake Charles Carbon Capture and Sequestration Project

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Lake Charles CCS Project (Proposed Project)

- Alternative CO2 Pipeline Route
- Proposed CO2 Pipeline Route
- CO2 Capture and Compression
- CO2 injection and Research MVA

LCC Gasification Project (Connected Action)

- Gasification Site and Related Offsite Activities

Existing EOR Operations

- Green Pipeline
- Hastings EOR
- State Boundary
- County Boundary
- Major waterbody

Figure 2.2-1
Lake Charles CCS Project
Overall Location
Texas and Louisiana

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Enclosure 2

Area of Potential Effect for
Proposed Lake Charles Carbon Capture and Sequestration Project Facilities in
Brazoria County, Texas

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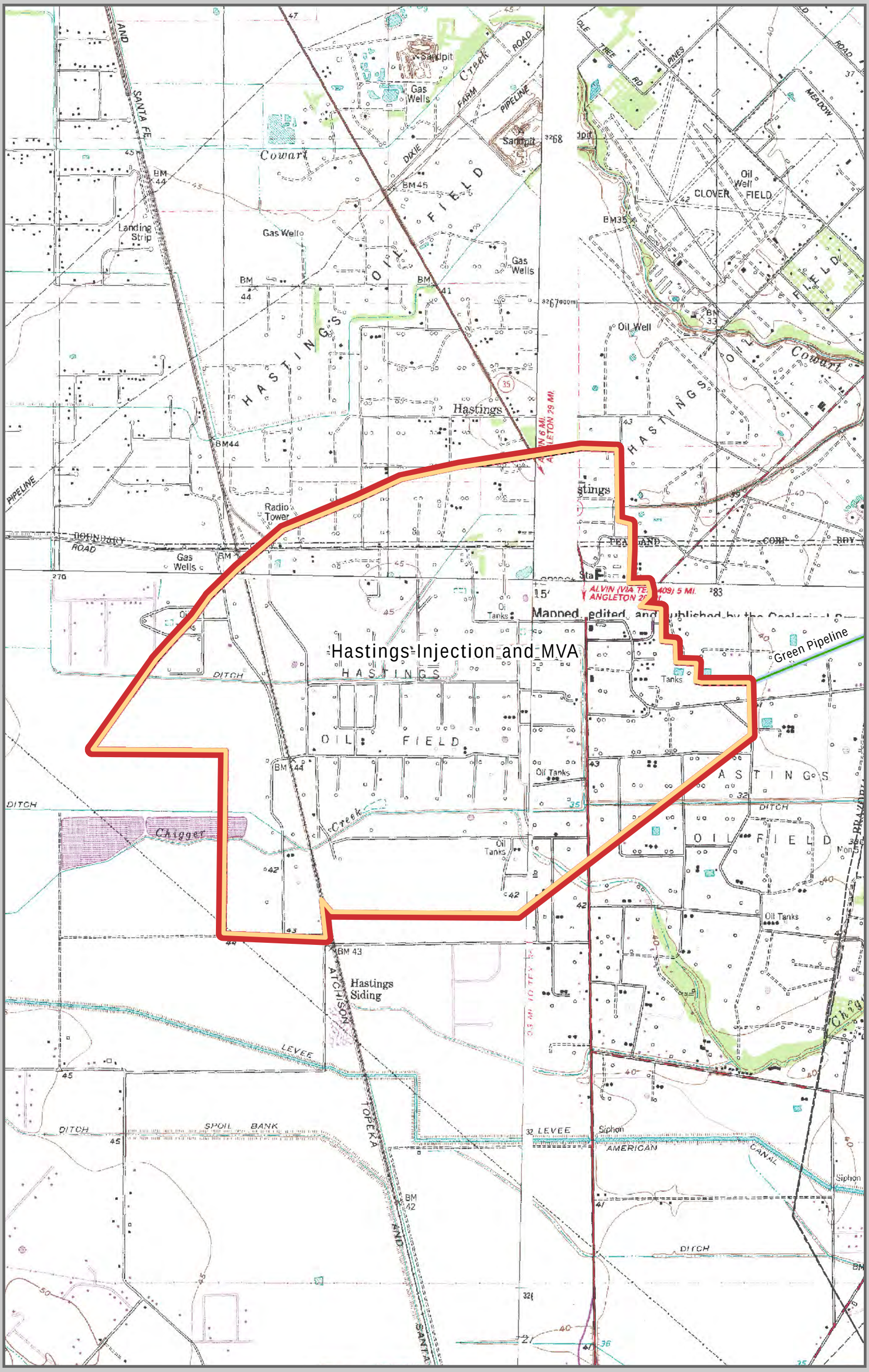


Figure 2
APE (Area of Potential Effect) for the Proposed AGR and Compression Site
Calcasieu Parish, Louisiana

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Enclosure 3

Previous Correspondence with the
Texas Historical Commission/Texas State Historic Preservation Office for the
MVA, Hastings Oil Field, Brazoria County

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WSA
ACRA
Consultants in Archaeology and Historic Preservation
www.williamself.com
575 Round Rock West Drive, Suite J-380,
Austin, TX 78681
Phone: (512) 394-7477
Fax: (512) 527-3078

October 25, 2011

Ms. Patricia Mercado-Allinger
State Archaeologist, Archeology Division
P.O. Box 12276
Austin, TX 78711-2276

RE: Denbury Onshore, LLC, CO2 Sequestration Monitoring, Verification, and Accounting (MVA), Hastings Field, Brazoria County, Texas.

Dear Ms. Mercado-Allinger:

INTRODUCTION

It is our understanding that Denbury Onshore, LLC (Denbury), will conduct monitoring, verification, and accounting (MVA) activities on CO_2-based enhanced oil recovery (EOR) operations in the Hastings Oil Field, Brazoria County, Texas (Figure 1). The proposed action is seeking U.S. Department of Energy (DOE) funding to conduct scientific research MVA activities to determine the effectiveness of EOR for long-term geologic storage of anthropogenic carbon dioxide (CO_2). The purpose of the proposed action is to test the application of carbon sequestration within a geologic formation concurrent with EOR. Specifically, additional research-oriented MVA activities will be conducted on CO_2-based EOR operations by Denbury in the Hastings Oil Field to further demonstrate the safety and effectiveness of long-term geologic storage of anthropogenic CO_2. Although the processes of geologic sequestration are relatively well known, additional research is needed to fill gaps in the scientific understanding of carbon sequestration to ensure the protection of human health and the environment, to reduce costs, and to facilitate the full-scale deployment of this technology. The goal is to possess the scientific understanding of carbon sequestration and develop to the point of deployment those options that insure large-scale, environmentally acceptable sequestration to reduce anthropogenic CO_2 emissions and/or atmospheric concentrations.

The research MVA activities will supplement privately-funded, on-going monitoring activities conducted in conjunction with Denbury's commercial EOR operations. While on-going monitoring will include both commercial and research monitoring activities, only the research MVA activities will be federally funded and subject to National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) Section 106 review. Commercial monitoring is linked to effective "best practices" procedures for an effective EOR CO_2 flood and to meet current regulatory

requirements. The commercial EOR flood and related monitoring will occur independent of federal funding and thus are not to be considered under NEPA or NHPA Section 106. Only the research MVA activities are subject to NEPA and NHPA Section 106 review.

William Self Associates, Inc. (WSA), is supporting CH2M HILL, Inc., in providing project environmental clearances for Denbury Onshore, LLC. WSA is conducting project cultural resource investigations and coordination with the Texas State Historic Preservation Officer (SHPO), consistent with NHPA Section 106. An Environmental Information Volume (EIV) was previously prepared to compile information required by NEPA to evaluate the potential for adverse environmental, ecological, cultural, and socioeconomic impacts of the proposed project (Walden and RDB Environmental Consultants 2010). This letter seeks to clarify the extent of Texas SHPO coordination that has previously occurred in the development of the EIV related to the project, and to elicit SHPO comment on the project responsibilities under Section 106 of the NHPA. It is our understanding the proposed project will be conducted entirely upon private lands.

PROJECT ENVIRONMENT AND ACTIVITIES

While the overall extent of the Hastings Oil Field consists of approximately 25 square miles of rural farmlands, suburban areas, and residential neighborhoods, the proposed project area is less than 4 square miles located between Alvin and Pearland, Texas, on State Highway 35 (Figure 1). State Highway 35 runs north–south through the eastern portion of the project area, and County Road 128 (Hastings Cannon Road) runs east–west along the northern portion of the project area. Numerous smaller county and private roads provide access to the site. A spur of the Burlington Northern (Atchison, Topeka & Santa Fe) Railroad also intersects the project area to the west. A large high-power transmission line is located just southwest of the project site.

The Hastings Oil Field was discovered in 1934, and oil production continues to be a primary land use in the area. The project area contains approximately 80 active, 100 inactive, and 110 plugged and abandoned wells, as well as a number of temporarily abandoned (TA) wells. Denbury is currently drilling and/or reworking a large number of wells in the Hastings Oil Field that will be used for injection of CO_2, production of oil and gas, testing, water production, and brine disposal. All activities related to the commercial operations at the Hastings project site will be permitted by the Texas Railroad Commission and implemented for Denbury's EOR operations. Again, EOR activities and associated monitoring will be completed by Denbury regardless of the implementation of the research MVA activities.

The following MVA activities will be conducted:

- Well Integrity Testing—Logging of existing idle production wells and testing of plugged and abandoned wells to detect CO_2 leakage through non-sealing well bores.
- Flood Conformance Testing—Augmentation of measurements to observe and model movement of CO_2 in subsurface formations during the EOR flood operations.
- Above-zone Monitoring—Monitoring of pressures and geochemical parameters in the formations above the confining layer to detect CO_2 leakage beyond the injection zone.

Research MVA activities will be conducted on a periodic or continual basis during active commercial EOR flood operations from 2012 through 2015.

In most cases, MVA activities will be conducted in or around existing Denbury idle or plugged and abandoned wells. Any new wells drilled for groundwater monitoring or soil-gas testing will be shallow and require only temporary placement and use of drilling equipment. Seismic profiles will be conducted with minimal surface disturbance and/or downhole equipment in existing wells. Above-zone testing will be conducted in selected idle wells that will be plugged back to above the confining layer to minimize potential impacts. If new wells are required, drilling will be performed at existing well pads, if at all possible. As a result of these measures, potential cultural impacts will be minimized or eliminated. However, significant benefits to the local economy may result from the increased production from the EOR activities at the Hasting Oil Field and its potential as a long-term anthropogenic CO_2 storage repository.

According to the 2001 USGS Land Use Survey, a large portion of the area is dedicated to pasture hay and cultivated crops. The majority of the remaining area is open space and represents low-intensity development. Pockets of medium-intensity and high-intensity development are located in the area, primarily along and just east of State Highway 35. Only small, scattered areas of deciduous forests and shrub/scrub remain. Cowart Creek is located in the northeastern section of the area and Chigger Creek flows through the southern edge. Both streams are small tributaries of Clear Creek, approximately 3.5 miles to the east of the site. Chigger Creek crosses the proposed project area from east to west in the southern quarter of the proposed project area. Within the project, this creek has been channelized and appears to have sizeable artificial levees on the north and south banks. In addition, the creek has been ponded into an artificial wetland at the point the creek exits the west side of the proposed project area. Based upon a review of existing aerial photography, both creeks appear to have been significantly channelized. There is one sizeable ditch that crosses the project area from southwest to northeast in the northern third of the proposed project area. This ditch is artificial in nature, appears to have sizeable levees on the banks, and is labeled “DITCH” on 7.5-minute topographic quadrangle maps.

Examination of the Texas Water Development Board (TWDB) Geologic Atlas of Texas, Houston Sheet indicates the project area is set entirely upon the Pleistocene-age Beaumont Formation (Qb), in particular Pleistocene-age muds, abandoned channel fill muds, and overbank fluvial muds. Further examination of the USDA Natural Resources Conservation Service Web Soil Survey indicates that the project area is mapped as Bernard clay loam; Bernard-Edna complex, and Lake Charles clay, 0–1 percent slopes. All these soils form on Beaumont Formation clays. Any Holocene deposition within the project area would be a surficial thin veneer. Many of the agricultural fields and developed areas represent disturbance with no potential for intact archaeological sites.

An extensive network of large oil and gas pipelines exists in this part of the North Gulf Texas coastal area and many run within a few miles of the project area. Denbury has identified pipelines owned and operated by the following companies in the West Hastings Field: BP Pipelines, Conoco Phillips, Enterprise Products, Exxon Mobil GGS, Kinder Morgan Tejas, Texas Eastern Transmission, TexCal Energy, and several others. A large network of smaller gathering pipelines also services the existing well sites in the Hastings Oil Field. High pressure and low pressure gas collection lines, production water and salt water lines, and power lines service the area as well.

BACKGROUND SEARCH

WSA has conducted a records and literature search for the proposed project area to within 0.5 mile outside the proposed project boundaries. The records and literature search/background research included reviewing the Texas Archeological Sites Atlas (Atlas), an online resource hosted by the Texas Historical Commission (THC), which contains restricted cultural resources information. The Atlas was consulted for information on previously conducted surveys or the presence of previously discovered prehistoric and historic archaeological sites as well as State Archeological Landmarks (SALs), Historic Markers, and Registered Texas Historic Landmarks that may be located within or adjacent to the project area. WSA also examined USGS topographic maps for existing cemeteries and historic sites. Archival research indicates that there are no recorded archaeological sites, cemeteries, NRHP properties, SALs, or markers within 0.5 mile (805 m) of the proposed project. There is one previously conducted survey that runs north–south through the eastern third of the proposed project area; it consisted of a 480-m-wide corridor centered on an existing pipeline corridor that runs parallel and west of the Atchison, Topeka & Santa Fe Railroad. This survey was a 2008 U.S. Army Corps of Engineers Survey conducted prior to pipeline construction. The survey was conducted by SWCA Environmental Consultants for the Denbury Green Pipeline located south of the current project. In 2008, a 124-mile length of the proposed Denbury Green Pipeline was surveyed in Calcasieu Parish, Louisiana, and in Orange, Jefferson, Chambers, Galveston, and Brazoria counties, Texas. One site was recorded on this survey, in Orange County, well away from the current proposed project area.

PREVIOUS AGENCY COORDINATION

As mentioned above, an Environmental Information Volume (EIV) was previously prepared to compile project information required by NEPA and NHPA Section 106 (Walden and RDB Environmental Consultants 2010). The EIV states that "The Texas Historical Commission has been contacted to confirm the locations of any existing or potential historical or archeological sites near the Hastings project site, and an official response is pending (Section 3.7:25)." This coordination letter in part seeks to clarify the format and extent of SHPO coordination that has previously occurred on the project, and to obtain copies of all correspondence to augment Denbury records. Previous coordination records are no longer available from the EIV authors. Further, EIV correspondence on the project indicates that the "Environmental Protection Agency (EPA) Region 6 Office of Environmental Justice and Tribal Affairs (EPA, 2010) and the Alabama Coushatta Indian Tribe (ACIT, 2010) were contacted regarding potential Native American tribal interests in or near the Hastings MVA project area. No sites were identified and an official response is pending" (Section 3.7:26). The EIV further states that "No Native American or tribal interests have been identified" (Section 4.7:29). These correspondences are cited in the EIV as personal communications (February 2010). WSA similarly contacted the EPA Region 6 Office and a representative of the Alabama Coushatta Indian Tribe in an attempt to obtain records of project correspondence. The results of these inquiries are pending.

NHPA SECTION 106

The MVA research project will result in very limited if any new ground disturbing impact due to the proposed project methods focusing on the reuse of existing facilities (see above). Additionally, the Hastings Oil Field represents a highly disturbed landscape due to decades of exploration and the presence of numerous oil companies' pipelines, wells, and support infrastructure, as described above. The project area contains over 250 extant, active, or abandoned wells and associated access roads and pipelines. The soils and geology indicate the project is entirely Pleistocene-age Beaumont Formation heavy clays. In this environment, Holocene deposition is very limited in extent if not entirely absent due to oil production and associated pipelines. The majority of the project area consists of cleared, denuded, pasture and agricultural fields or oil lands. Both creeks in the project exhibit exceptional linear symmetry indicating channelization and significant modification of the natural stream courses. In these circumstances, little in the way of intact, undisturbed Holocene deposition remains. Background archival research indicates a complete absence of previously recorded cultural resources.

CONCLUSIONS AND RECOMMENDATIONS

Due to the combination of limited project ground disturbance, significant oil production and pipeline disturbance, and ancient landform, WSA concludes that there exists a very low probability that properties eligible for the National Register of Historic Places (NRHP) will be impacted by the proposed research project. WSA respectfully requests SHPO concurrence with the conclusion that there exists a low probability that significant NRHP-eligible cultural resources will be impacted by the proposed MVA project and that project activities be allowed to proceed with respect to Section 106 requirements under the NHPA, and concurrence that no archaeological survey is required under Section 106. Second, WSA respectfully requests copies of all previous SHPO correspondence (from 2010) on the project, on behalf of Denbury, to complete their project records. WSA also respectfully requests any SHPO input on Native American Tribal coordination in terms of identifying any federally recognized tribes that may have interests in the project area.

This letter is submitted to the SHPO to initiate (or continue) NHPA Section 106 consultation on the project. WSA respectfully submits this coordination letter on behalf of Denbury and CH2M HILL. We request concurrence and/or comment with regard to project Section 106 responsibilities. We would be pleased to facilitate transfer of any project records by visiting your office. If there are any questions or any need for additional information needed please feel free to contact me.

Sincerely,

James W. Karbula Ph.D., RPA
Regional Project Director

cc:
David Thomas, CH2M HILL, Inc.

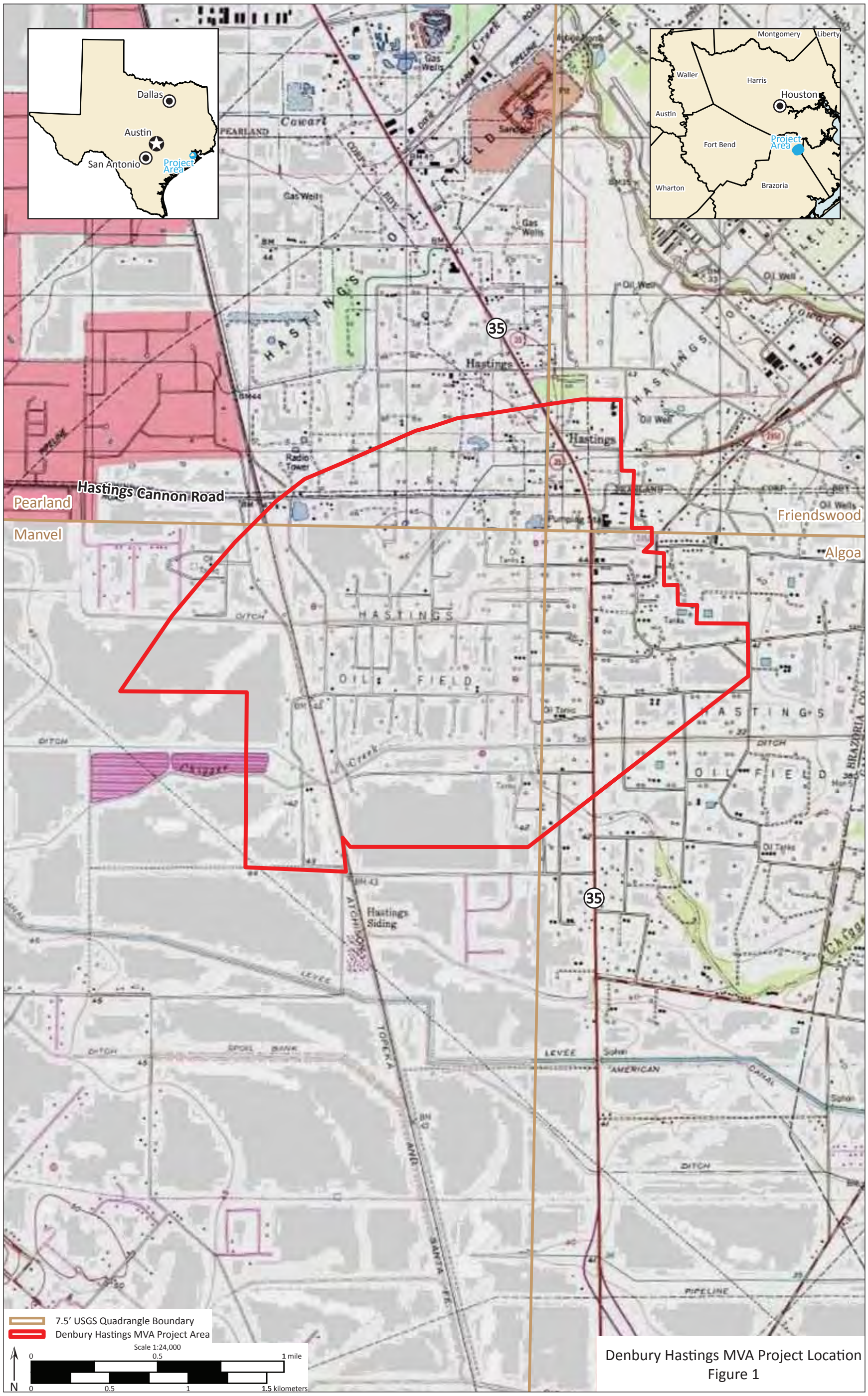
Attachments:
Figure 1

REFERENCES CITED

Alabama Coushatta Indian Tribe (ACIT), 2010, personal communications with Bryant Celestine, Tribal Historian, February 12, 2010, by Steve Walden Consulting & RDB Environmental Consulting.

Environmental Information Volume, CO_2 Sequestration Monitoring, Verification, and Accounting Hastings Field, Texas, prepared for Denbury Onshore, LLC, by Steve Walden Consulting & RDB Environmental Consulting, March 2010.

U.S. Environmental Protection Agency (EPA), 2010, Region 6 Office of Environmental Justice and Tribal Affairs, Dallas, Texas, personal communications with Jay Harris, GAP Project Officer and Tribal Liaison, February 12, 2010, by Steve Walden Consulting & RDB Environmental Consulting.



Denbury Hastings MVA Project Location
Figure 1

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November 1, 2011

James Karbula
William Self Associates, Inc.
16238 Highway 620, Ste. F-400
Austin, Texas 78717

Re: Project review under Section 106 of the National Historic Preservation Act of 1966 and the Antiquities Code of Texas
Denbury Onshore, LLC, CO2 Sequestration Monitoring, Verification, and Accounting (MVA), Hastings Field, Brazoria County, Texas

Dear Mr. Karbula:

Thank you for your correspondence describing the above referenced project. This letter serves as comment on the proposed undertaking from the Executive Director of the Texas Historical Commission and the State Historic Preservation Officer. As the state agency responsible for administering the Antiquities Code of Texas, these comments also provide recommendations on compliance with state antiquities laws and regulations.

The review staff, led by Jeff Durst, has completed its review. After reviewing the documentation, we concur that there exists a very low probability that properties located within the above referenced project area and eligible for inclusion in the National Register of Historic Places (National Register) and/or for formal designation as a State Archeological Landmark, will be impacted by the proposed research project. The above referenced project may proceed without consultation with this office, provided that no significant archeological deposits are encountered during development activities on the property.

At your request we have attached a copy of the previous correspondence dating to 2010 that we have on file related to this project.

Thank you for your cooperation in this federal review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we can be of further assistance, please contact Jeff Durst at 512/463-6096.**

Sincerely,

for
Mark Wolfe, State Historic Preservation Officer

MW/jjd

Attachment: Review of Public Notice issued by U.S. Army Corps of Engineers Galveston District

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Public Notice

U.S. Army Corps Of Engineers Galveston District

Permit Application No:	SWG-2010-00194
Date Issued:	8 July 2010
Comments Due:	9 August 2010

U.S. ARMY CORPS OF ENGINEERS, GALVESTON DISTRICT

PURPOSE OF PUBLIC NOTICE: To inform you of a proposal for work in which you might be interested. It is also to solicit your comments and information to better enable us to make a reasonable decision on factors affecting the public interest.

AUTHORITY: This application will be reviewed pursuant to Section 404 of the Clean Water Act.

APPLICANT: Denbury Onshore, LLC
5100 Tennyson Parkway, Suite 3000
Plano, Texas 75024-4932

AGENT: Project Consulting Services, Inc.
3300 West Esplanade Avenue South, Suite 500
Metairie, Louisiana 70002-3447
Telephone: 504-833-5321
POC: Richard Leonhard

LOCATION: The project is located on a 47-acre tract within an existing oil field located approximately 4,500 feet southwest of the State Highway 35 and County Road 128 intersection, in Brazoria County, Texas. The project can be located on the U.S.G.S. quadrangle map entitled: Manvel and Pearland, Texas. Approximate UTM Coordinates in NAD 27 (meters): Zone 15; Easting: 280760; Northing: 3265475. Latitude: 29° 29' 58.69" N. Longitude: 95° 15' 41.71" W (NAD 27).

PROJECT DESCRIPTION: The applicant proposes permanent fill impacts to 7.08 acres of herbaceous and shrub scrub jurisdictional wetlands during the construction of a foundation for a facility designed to support the sequestering and recovery of CO_2, all of which are associated with enhanced oil recovery processes for reserves located within the project area. The proposed project site is located within an existing oil field and is in an area presently used for farming and livestock grazing. The area is dominated by yaupon (*Ilex vomitoria*), Chinese tallow (*Sapium sebiferum*), little bluestem (*Schizachyrium scoparium*), bushy bluestem (*Andropogons glomeratus*) and southern dewberry (*Rubus trivialis*).

The project site was selected due to the fact that it is centrally located within the Hastings Field. The project footprint was designed and situated to avoid jurisdictional wetland impacts to the maximum extent practicable. Of the 19.2 acres of jurisdictional wetlands on the tract, 12.12 acres of wetlands will be avoided. Existing infrastructure is located directly adjacent to the site, which minimizes the potential for additional wetland impacts. The applicant proposes to mitigate for the proposed unavoidable impacts to 7.08 acres of wetlands by donating a 60-acre tract composed of cypress-tupelo swamp to the Big Thicket National Preserve. The mitigation tract is located directly south of the tract that was previously utilized as mitigation for the Denbury Green Pipeline project, permitted under SWG-2007-01963.

NOTES: This public notice is being issued based on information furnished by the applicant. This information has not been verified. The applicant's plans in 6 sheets, Alternative Analysis in 2 sheets and Mitigation Plan in 3 sheets are enclosed.

A preliminary review of this application indicates that an Environmental Impact Statement (EIS) is not required. Since permit assessment is a continuing process, this preliminary determination of EIS requirement will be changed if data or information brought forth in the coordination process is of a significant nature.

Our evaluation will also follow the guidelines published by the U.S. Environmental Protection Agency pursuant to Section 404 (b)(1) of the Clean Water Act (CWA).

OTHER AGENCY AUTHORIZATIONS: Texas Railroad Commission certification is required. Texas Coastal Zone consistency certification is required. The applicant has stated that the project is consistent with the Texas Coastal Management Program goals and policies and will be conducted in a manner consistent with said program.

NATIONAL REGISTER OF HISTORIC PLACES: The staff archaeologist has reviewed the latest published version of the National Register of Historic Places, lists of properties determined eligible, and other sources of information. The following is current knowledge of the presence or absence of historic properties and the effects of the undertaking upon these properties:

The permit area has been so extensively modified that little likelihood exists for the proposed project to impinge upon a historic property, even if present within the affected area.

THREATENED AND ENDANGERED SPECIES: Preliminary indications are that no known threatened and/or endangered species or their critical habitat will be affected by the proposed work.

ESSENTIAL FISH HABITAT: This notice initiates the Essential Fish Habitat consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. Our initial determination is that the proposed action would not have a substantial adverse impact on Essential Fish Habitat or federally managed fisheries in the Gulf of Mexico. Our final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the National Marine Fisheries Service.

PUBLIC INTEREST REVIEW FACTORS: This application will be reviewed in accordance with 33 CFR 320-332, the Regulatory Programs of the Corps of Engineers (Corps), and other pertinent laws, regulations and executive orders. The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors, which may be relevant to the proposal, will be considered: among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs and, in general, the needs and welfare of the people.

SOLICITATION OF COMMENTS: The Corps is soliciting comments from the public, Federal, State, and local agencies and officials, Indian tribes, and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Impact Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

This public notice is being distributed to all known interested persons in order to assist in developing facts upon which a decision by the Corps may be based. For accuracy and completeness of the record, all data in support of or in opposition to the proposed work should be submitted in writing setting forth sufficient detail to furnish a clear understanding of the reasons for support or opposition.

PUBLIC HEARING: Prior to the close of the comment period any person may make a written request for a public hearing setting forth the particular reasons for the request. The District Engineer will determine whether the issues are substantial and should be considered in the permit decision. If a public hearing is warranted, all known interested persons will be notified of the time, date, and location.

CLOSE OF COMMENT PERIOD: All comments pertaining to this Public Notice must reach this office on or before **9 August 2010**. Extensions of the comment period may be granted for valid reasons provided a written request is received by the limiting date. **If no comments are received by that date, it will be considered that there are no objections**. Comments and requests for additional information should be submitted to:

Kristy Farmer
Regulatory Branch, CESWG-PE-RE
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229
409-766-3935 Phone
409-766-6301 Fax

DISTRICT ENGINEER
GALVESTON DISTRICT
CORPS OF ENGINEERS

Enclosure 4

List of Federally Recognized Indian Tribes for the portions of the Proposed Lake Charles CCS Project in Brazoria County, Texas

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List of Federally Recognized Indian Tribes with a Potential Interest in the proposed Lake Charles CCS Project in Brazoria County, Texas

Federally-recognized Indian Tribe	Potential Interest
Alabama Coushatta Tribe of Texas	Located in Texas
Kickapoo Traditional Tribe of Texas	Located in Texas
Ysleta Del Sur Pueblo of Texas	Located in Texas

Sources: BIA 2011; NPS 2011c, 2011d, 2011e, 2011f, Sturtevant 1967.

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NETL
NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA
U.S. DEPARTMENT OF ENERGY

RECEIVED
AUG 24 2012
Texas Historical Commission

August 15, 2012

Mr. Mark Wolfe
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Brazoria County, Texas (and Calcasieu Parish, Louisiana)

Dear Mr. Wolfe:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, the DOE is consulting with the Texas Historical Commission on the proposed project.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, in Brazoria County, Texas. Please note that as of June 1, 2012, the name of Lake Charles Cogeneration, LLC was changed to Lake Charles Clean Energy, LLC. Historical references to Lake Charles Cogeneration (LCC) Gasification are now LCCE Gasification.

During the DOE demonstration phase of the proposed project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, and transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation.

626 Cochrans Mill Road, P.O. Box 10940, Pittsburgh, PA 15236
pierna.fayish@netl.doe.gov • Voice (412) 386-5428 • Fax (412) 386-4775 • www.netl.doe.gov

A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field during the demonstration period.

As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the Lake Charles CCS Project and its associated CO_2 capture and compression facilities in Calcasieu Parish, Louisiana;
- the Lake Charles CCS Project proposed 11.1 mile CO_2 pipeline in Calcasieu Parish Louisiana;
- Lake Charles CCS Project proposed Research Monitoring, Verification, Analysis (MVA) program for the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation in Brazoria County, Texas; and
- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (connected action).

DOE has determined that the area of potential effects (APE) for the undertaking will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCCE Gasification, which are located in Calcasieu Parish, Louisiana and in Brazoria County, Texas. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Texas includes the location of the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation and Research MVA program at the existing Hastings Oil Field in Brazoria County, Texas (see Enclosure 2).

The APE in Calcasieu Parish, Louisiana includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area (see Enclosure 2).
- the proposed new 11.1-mile long CO_2 pipeline transporting CO_2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline (to the southwest).

In October 2011, William Self Associates, Inc. (WSA) conducted a records and literature search of the area within the Research MVA portion of the APE for the proposed action (Karbula 2011). The results of this records and literature search were sent to your office on October 25, 2011 and are included in Enclosure 3. The purpose of the records and literature search by WSA was to determine the presence of previously identified cultural resources and historic properties within the Research MVA portion of the APE; to determine the extent of previous and existing disturbance

and development within the Research MVA portion of the APE; and to evaluate the potential sensitivity of the Research MVA portion of the APE for unidentified cultural resources or historic properties. Results of the records and literature search by WSA indicated that there are no recorded archaeological sites, cemeteries, NRHP properties, State Archaeological Landmarks (SAL) or markers within the Research MVA portion of the APE. Because the Hastings Oil Field is a highly disturbed landscape resulting from decades of exploration for oil and characterized by the presence of numerous oil companies' pipelines, wells and support infrastructure, the potential for intact undisturbed soil profiles with archaeological sensitivity within the Research MVA portion of the APE is limited, if not entirely absent (Karbula 2011).

As a result of the records and literature search, WSA recommended that the Research MVA portion of the APE has a low probability for containing NRHP-eligible historic properties and that no archeological survey of the Research MVA areas is needed for the Proposed Action (Karbula 2011). The Texas State Historic Preservation Officer (SHPO) concurred that the Research MVA area has a very low probability for containing NRHP-eligible properties and/or for formal designation as an SAL, and indicated that the Research MVA portion of the Proposed Action may proceed without consultation with the Texas SHPO, provided that no significant archaeological deposits are encountered during development activities within the Research MVA area (Wolfe 2011). Documentation of the previous consultation between WSA and your office regarding the results of the records and literature search and archaeological sensitivity assessment for the APE in Brazoria County is in Enclosure 3.

DOE is not aware of any other previously conducted cultural resources investigations in the portion of the APE in Brazoria County, Texas (i.e., at the location of the proposed Hasting injection site and Research MVA program at the existing Hastings Oil Field). DOE confirmed that no NRHP-listed historic properties or districts, neighborhood surveys, historical markers, cemeteries, museums, historic county courthouses, military sites, or SALs that are buildings are within the APE or a 0.5 mile radius around the APE in Brazoria County, Texas (NPS 2011a, 2011b; Texas Historical Commission [THC] 2011).

In accordance with Section 106 of the NHPA, DOE is writing to seek your concurrence on the proposed project's APE in Texas per 36 CFR 800.4(a)(1). DOE is also seeking your concurrence with DOE's proposed determination of no historic properties affected for the proposed project under 36 CFR 800.4(d)(1), based on the results of the records and literature search by WSA and the conclusions included in correspondence between your office and WSA.

DOE has identified three federally recognized Indian Tribes with a potential interest in the portions of the proposed project in Texas (see Enclosure 4) and is also seeking information from your office for any other parties that may have an interest in the Section 106 consultation process for the proposed project in accordance with 36 CFR 800.3(f). Additionally, DOE would appreciate your assistance with the identification of any additional issues or concerns regarding cultural resources or historic properties in Texas that may be affected by the proposed project. DOE is conducting separate consultation with the Louisiana SHPO and federally recognized Indian Tribes and other consulting parties for the proposed new facilities in Calcasieu Parish, Louisiana.

DOE looks forward to receiving your concurrence with the APE and the determination of effects on historic properties for the portion of the proposed project that is in Brazoria County, Texas, and your comments on any issues or concerns for cultural resources or historic properties that might be

affected by the proposed project or on any other parties that may have an interest in the Section 106 consultation for the proposed project. Please forward the results of your review and any requests for additional information to our contractor:

Janine Whitken
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, New York 14086
(716) 684-8060 extension 2745
JWhitken@ene.com

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,

Jose P. Garcia

For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Brazoria County, Texas
3. Previous correspondence with the THC/Texas SHPO for the Hastings injection site and MVA
4. List of federally recognized Indian tribes

NO HISTORIC PROPERTIES AFFECTED
PROJECT MAY PROCEED
by William A. Martin
for Mark Wolfe
State Historic Preservation Officer
Date 9/7/12
Track#

NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA

U.S. DEPARTMENT OF ENERGY

August 16, 2012

Robert Cast
Tribal Historic Preservation Officer
Caddo Nation
P.O. Box 487
Binger, OK 73009

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Mr. Cast:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Caddo Nation on the portion of the proposed project in Louisiana.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

626 Cochrans Mill Road, P.O. Box 10940, Pittsburgh, PA 15236
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As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the facilities associated with the Lake Charles CCS Project and its associated CO_2 capture and compression facilities in Calcasieu Parish, Louisiana;
- the Lake Charles CCS Project proposed 11.1-mile long CO_2 pipeline in Calcasieu Parish;
- the Lake Charles CCS Project proposed Research MVA program for the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation in Brazoria County, Texas; and,
- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (a connected action).

DOE has determined that the area of potential effects (APE) for the undertaking in Louisiana will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCCE Gasification that are located in Calcasieu Parish, Louisiana. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Louisiana is in an industrial setting on the west side of the Calcasieu River, and is in the vicinity of numerous energy-related facilities. The APE includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area
- the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest (see Enclosure 2).

Cultural resources investigations have been conducted within portions of the APE in Louisiana, including: Phase I archaeological survey of the property that contains the locations of the Lake Charles CCS Project and LCCE Gasification project; Phase I cultural resources survey of the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline, including extra workspace and access roads; and Phase IA cultural resources investigations of offsite facilities associated with the LCCE Gasification project (raw water, hydrogen, potable water, methanol and sulfuric acid pipelines; an overhead transmission line; a construction laydown area; and construction parking area). The reports documenting these cultural resources investigations have been submitted separately to the Louisiana SHPO for review and comment by the consultants on behalf of the Applicant. A table summarizing the cultural resources investigations is in Enclosure 3.

DOE has confirmed that no NRHP-listed historic properties or previously recorded standing structures or historic districts are located within the APE or a 0.5-mile radius around the APE in Calcasieu Parish, Louisiana (NPS 2011a, 2011b; Louisiana Department of Culture, Recreation and Tourism 2011).

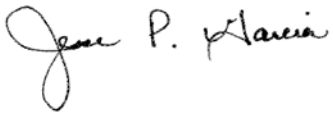
The DOE is also initiating Section 106 consultation with the Louisiana State Historic Preservation Officer to identify any issues or concerns regarding cultural resources and historic properties in the APE in Calcasieu Parish, Louisiana that may be affected by the proposed Project as part of the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800. Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), will be invited to participate in the Section 106 consultation process.

The DOE looks forward to receiving your comments or concerns regarding traditional cultural properties, sacred sites, or site of traditional religious or cultural importance in the APE that might be affected by the proposed Project and an indication as to whether you wish to participate in the Section 106 consultation for the proposed project. Please forward the results of your review and any requests for additional information to DOE's tribal liaison for the Project:

Jesse Garcia
NETL Tribal Liaison
Environmental Compliance Division
National Energy Technology Laboratory
3610 Collins Ferry Road
Mail Stop B07, Room 333
Morgantown, WV 26507
PH: 304-285-0256
Fax: 304-285-4403
Jesse.Garcia@NETL.doe.gov

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Calcasieu Parish, Louisiana
3. Summary Table for Cultural Resources Investigations Conducted within the APE in Louisiana

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References:

Breaux, Pam. 2012. Letter dated April 25, 2012, from Pam Breaux, State Historic Preservation Officer, Office of Cultural Development, Louisiana Department of Culture, Recreation & Tourism, Baton Rouge, Louisiana, to Joel Watkins, Cultural Resource Analyst, Office of Archaeological Research, Moundville, Alabama. RE: *Draft Report, La Division of Archaeology Report No. 22-4007, Phase I Cultural Resource Survey of the Proposed Lake Charles Pipeline Lateral Project located near Sulphur, Calcasieu Parish, Louisiana*.

Handley, Martin. 2009. Letter dated June 15, 2009, from Martin Handley, Principal Investigator, URS Corporation, Baton Rouge, Louisiana, to Mr. Donald W. Maley, Vice-President, Lake Charles Cogeneration, LLC, Houston, Texas. RE: *Field Assessment of Archaeological Site 16CU29, Lake Charles Gasification Facility, Lake Charles Cogeneration, LLC, Westlake, Calcasieu Parish, Louisiana*.

Handley, Martin. 2012. Letter dated May 16, 2012, from Martin Handley, Principal Investigator, URS Corporation, Baton Rouge, Louisiana, to Mr. Philip Leonards, Leucadia Energy, Houston, Texas. Re: *Cultural Resources Evaluation - Lake Charles Cogeneration, LLC (LCC), Calcasieu Parish, Louisiana*.

Hutcheson, Scott. 2009. Letter dated June 26, 2009, from Scott Hutcheson, State Historic Preservation Officer, Office of Cultural Development, Department of Culture, Recreation and Tourism, State of Louisiana, Baton Rouge, Louisiana. RE: *Lake Charles Gasification Facility, Lake Charles Cogeneration LLC, Agency Interest No. 160213, Activity No. PER20090001, Lake Charles, Calcasieu Parish, LA.*

Louisiana Department of Culture, Recreation and Tourism. 2011a. Louisiana Cultural Resources Map: Standing Structures and Historic Districts within 0.5 miles of Project Areas in Calcasieu Parish, Louisiana. http://kronos.crt.state.la.us/website/lahpweb/viewer.htm (web site accessed March 7, 2011).

National Park Service. 2011a. National Historic Landmarks Program, Lists of National Historic Landmarks: National Historic Landmarks Survey, Listing of National Historic Landmarks by State: Louisiana and Texas. http://www.nps.gov/history/nhl/designations/Lists/LA01.pdf and http://www.nps.gov/history/nhl/designations/Lists/TX01.pdf (web sites accessed March 7, 2011).

National Park Service. 2011b. National Register of Historic Places, NPS Focus: Calcasieu Parish, Louisiana and Brazoria County, Texas. http://nrhp.focus.nps.gov/natreghome.do (web site accessed March 7, 2011).

Smith, R. L., M. E. Weed, A. I. Wilson, and A. Deter-Wolf. 2001. *Intensive Cultural Resources Survey – Citgo Petroleum Corporation, Lake Charles Refinery, Calcasieu Parish, Louisiana*. Report No. 22-2382, on file, Louisiana Division of Archaeology, Baton Rouge, Louisiana. Cited in letter dated June 15, 2009, from Martin Handley, Principal Investigator, URS Corporation, Baton Rouge, Louisiana, to Mr. Donald W. Maley, Vice-President, Lake Charles Cogeneration, LLC, Houston, Texas. RE: *Field Assessment of*

Archaeological Site 16CU29, Lake Charles Gasification Facility, Lake Charles Cogeneration, LLC, Westlake, Calcasieu Parish, Louisiana.

URS Corporation. 2012. *Lake Charles Cogeneration, LLC, Cultural Resources Assessment, Calcasieu Parish, Louisiana*. URS Job No. 10003620, July 2012.

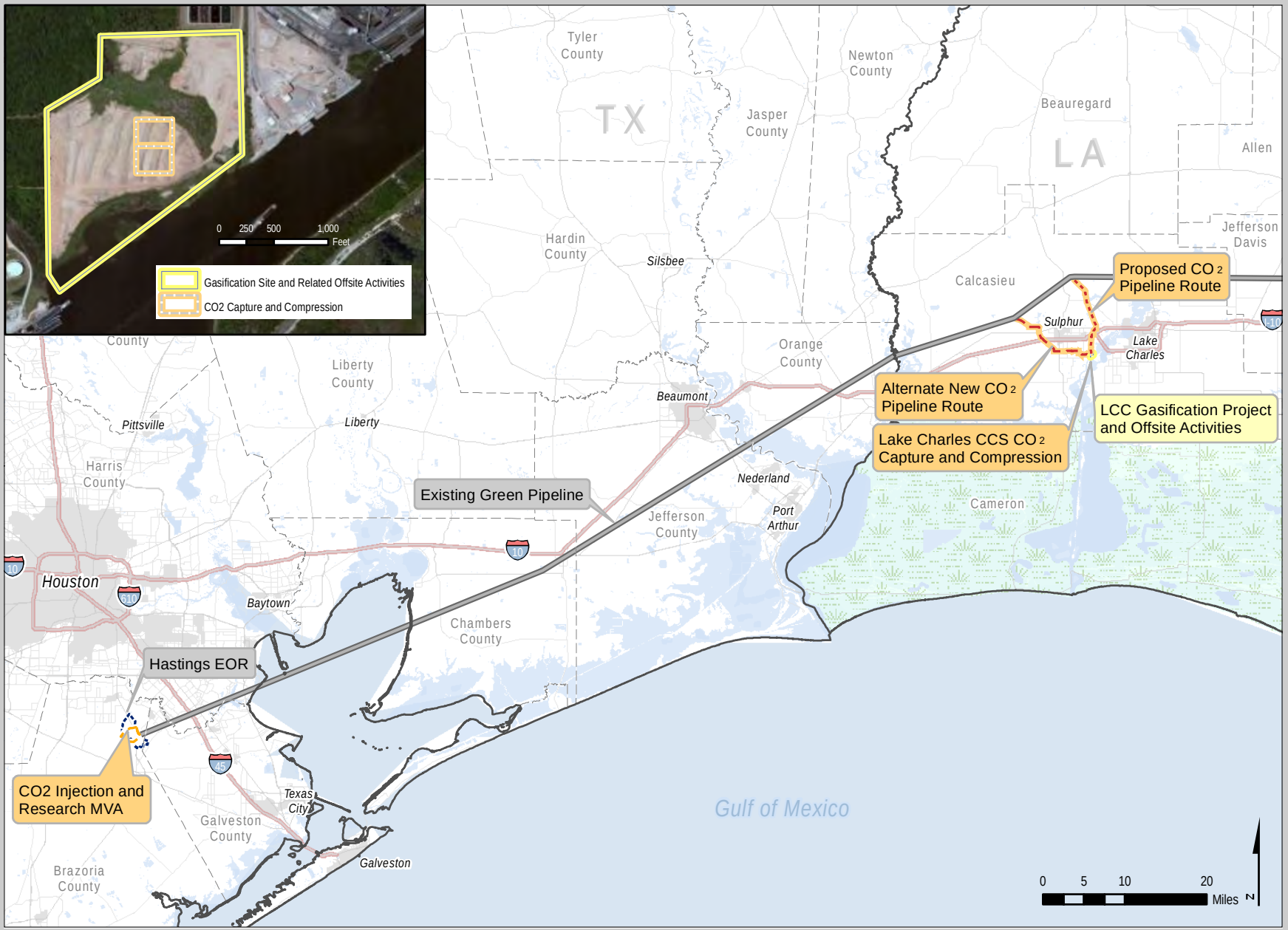
Watkins, Joel H. and Eugene M. Futato. 2011. *Phase I Cultural Resource Survey of the Proposed Lake Charles Pipeline Lateral Project located near Sulphur, Calcasieu Parish, Louisiana*. Draft report prepared November 21, 2011, by the University of Alabama, Office of Archaeological Research, Moundville, Alabama. Prepared for CH2M HILL, Atlanta, Georgia.

Enclosure 1

Location of the Proposed
Lake Charles Carbon Capture and Sequestration Project

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Path: M:\Houston\Lake_Charles_Leucadia\Maps\MXDs\ThirdParty_EIS\May31_2012\Cultural\Updated\OverviewProjectLocation.mxd



Lake Charles CCS Project (Proposed Project)

- Alternative CO2 Pipeline Route
- Proposed CO2 Pipeline Route
- CO2 Capture and Compression
- CO2 injection and Research MVA

LCC Gasification Project (Connected Action)

- Gasification Site and Related Offsite Activities

Existing EOR Operations

- Green Pipeline
- Hastings EOR
- State Boundary
- County Boundary
- Major waterbody

Figure 2.2-1
Lake Charles CCS Project
Overall Location
Texas and Louisiana

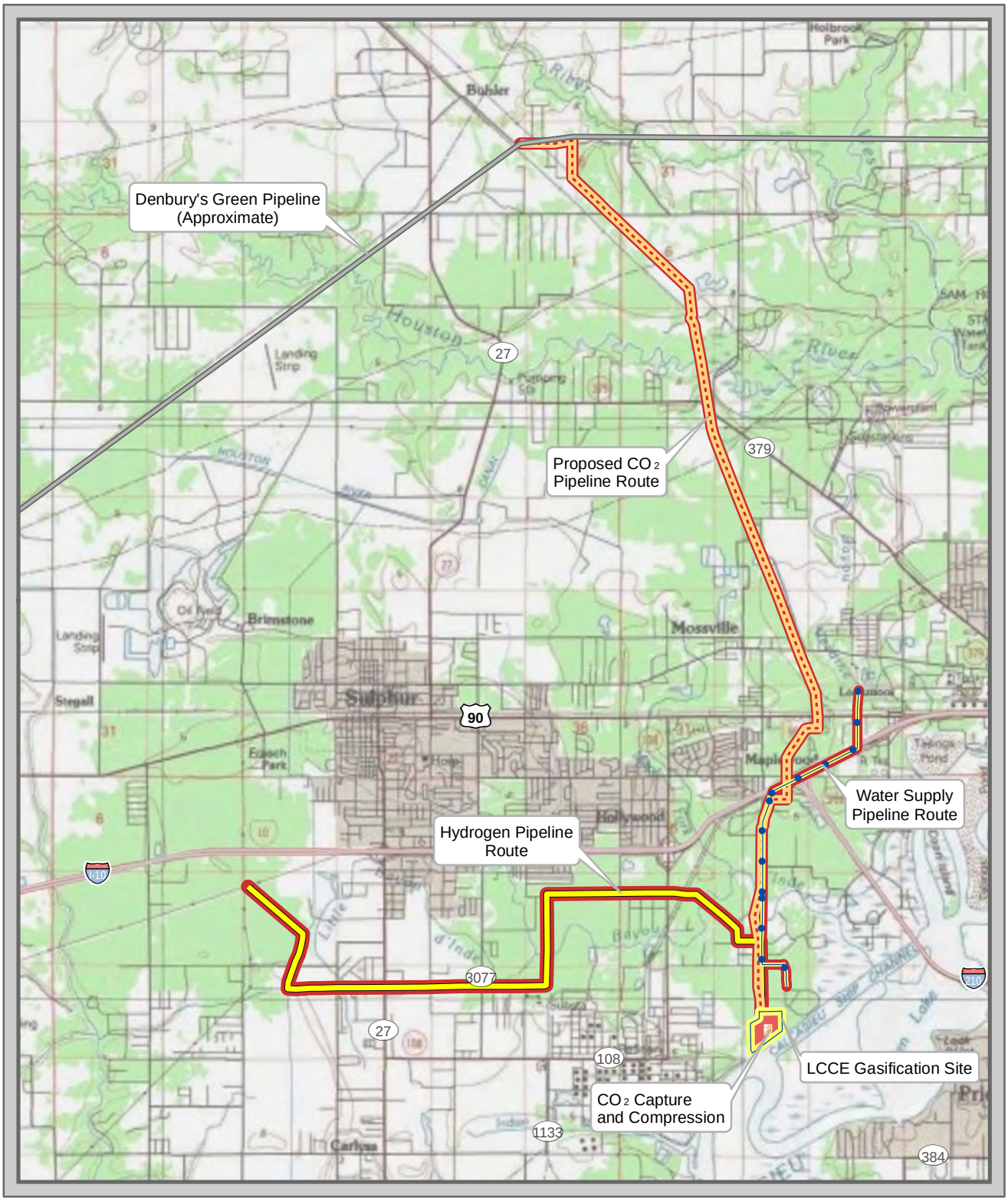
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Enclosure 2

Area of Potential Effect
for Proposed Lake Charles Carbon Capture and Sequestration Project Facilities
in Calcasieu Parish, Louisiana

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Path: M:\Houston\Lake_Charles_Leucadia\Maps\MXDs\ThirdParty_EIS\May31_2012\Cultural\Updated\LA APE Overview Map_June27_2012.mxd



N

0 0.25 0.5 1 Miles

Area of Potential Effect (APE)

Lake Charles CCS Project (Proposed Action)

Alternative CO2 Pipeline Route

CO2 Capture and Compression

Proposed CO2 Pipeline Route

Existing Operations (Not in Project or Proposed Action)

Green Pipeline

LCCE Gasification Project (Connected Action)

Gasification Site and Related Offsite Activities

Water Supply Pipeline Route

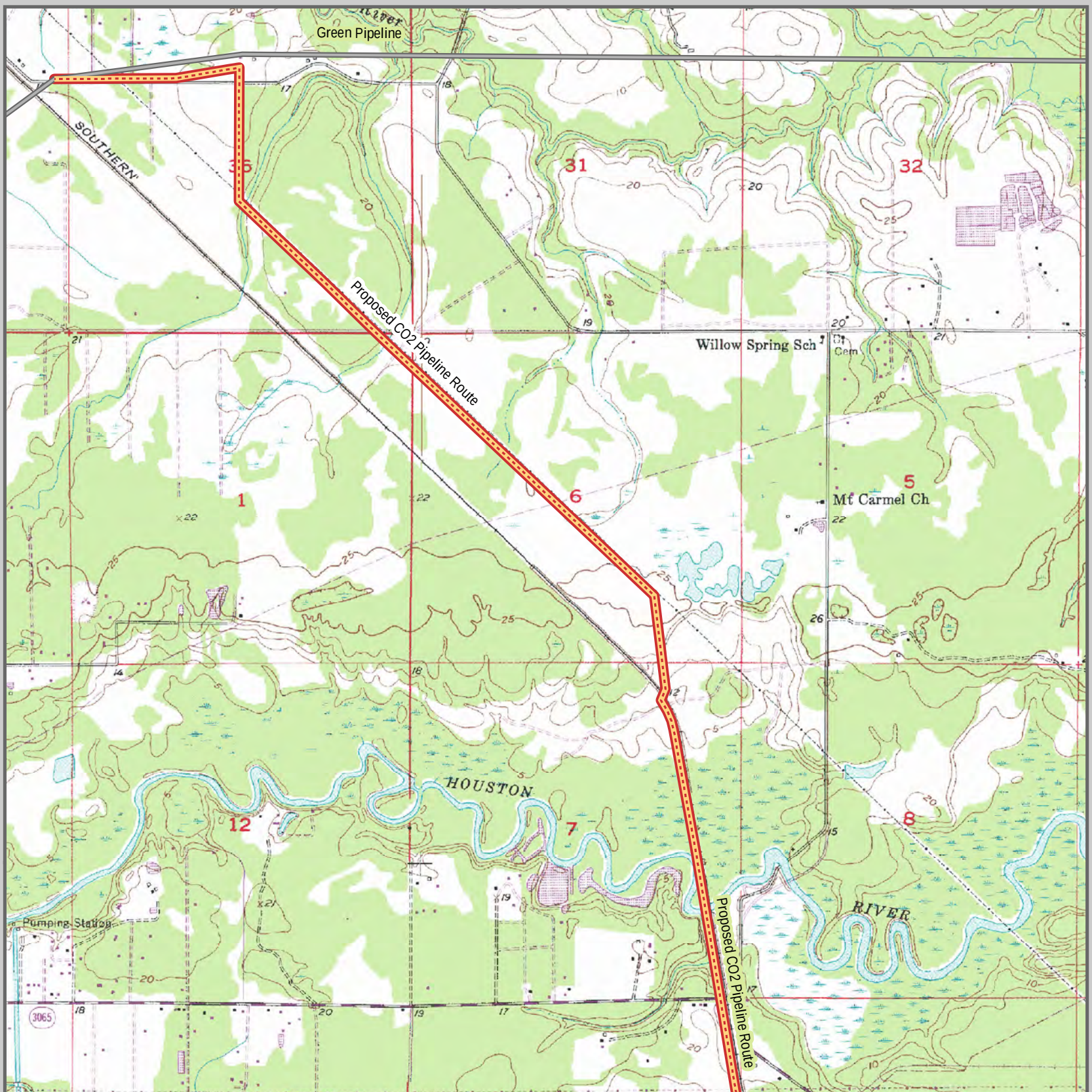
Hydrogen Pipeline Route

Figure 1
Overview of the APE (Area of Potential Effect) for the Proposed Facilities within Calcasieu Parish, Louisiana

Source: USGS 1:24,000 Friendswood (1998); Pearland (1983); Manval (1977); and Algoa (1977) Quadrangles.

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N

0 0.125 0.25 0.5 Miles

Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Area of Potential Effect (APE)

Existing Operations (Not in Project or Proposed Action)

Green Pipeline

Lake Charles CCS Project (Proposed Action)

CO2 Capture and Compression

Proposed CO2 Pipeline Route

Lake Charles Gasification Project (Connected Action)

Gasification Site

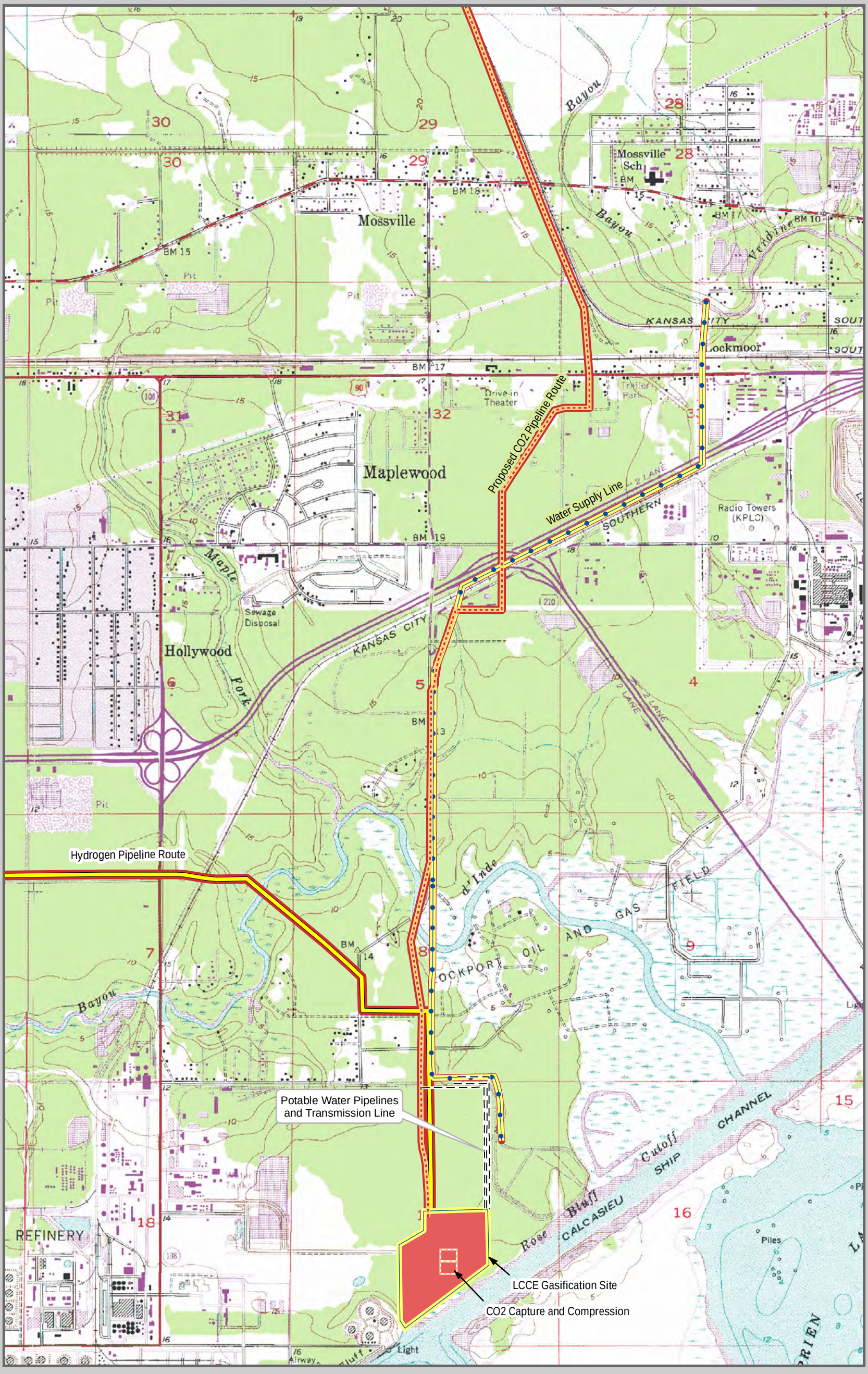
Water Supply Line

Hydrogen Pipeline Route

Figure 1-1
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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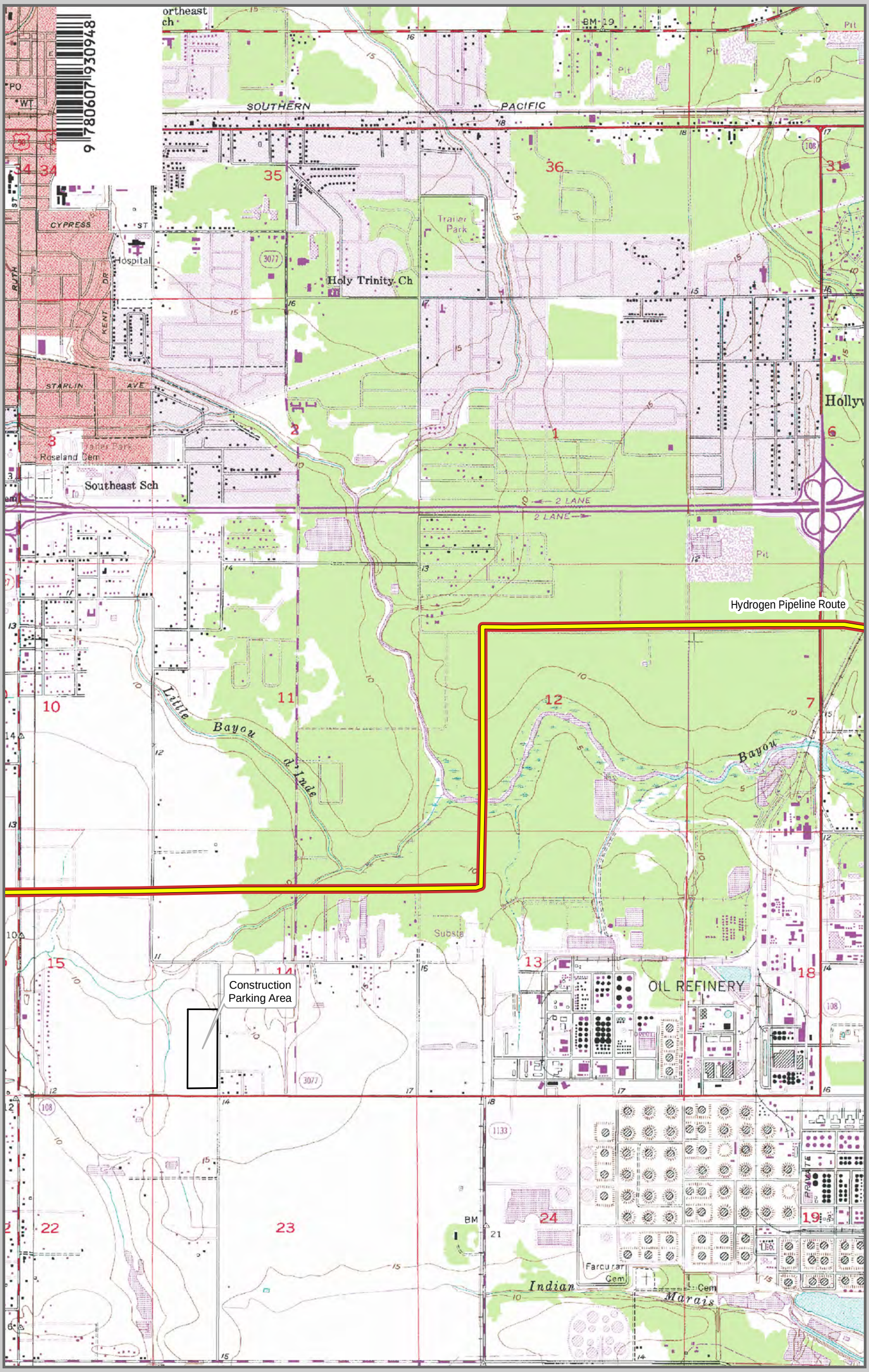


Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Figure 1-2
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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N

0 0.125 0.25 0.5 Miles

Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Area of Potential Effect (APE)

Existing Operations (Not in Project or Proposed Action)

Green Pipeline

Lake Charles CCS Project (Proposed Action)

CO2 Capture and Compression

Proposed CO2 Pipeline Route

Lake Charles Gasification Project (Connected Action)

Gasification Site

Water Supply Line

Hydrogen Pipeline Route

Figure 1-3

APE (Area of Potential Effect) for the Proposed Facilities within

Calcasieu Parish, Louisiana

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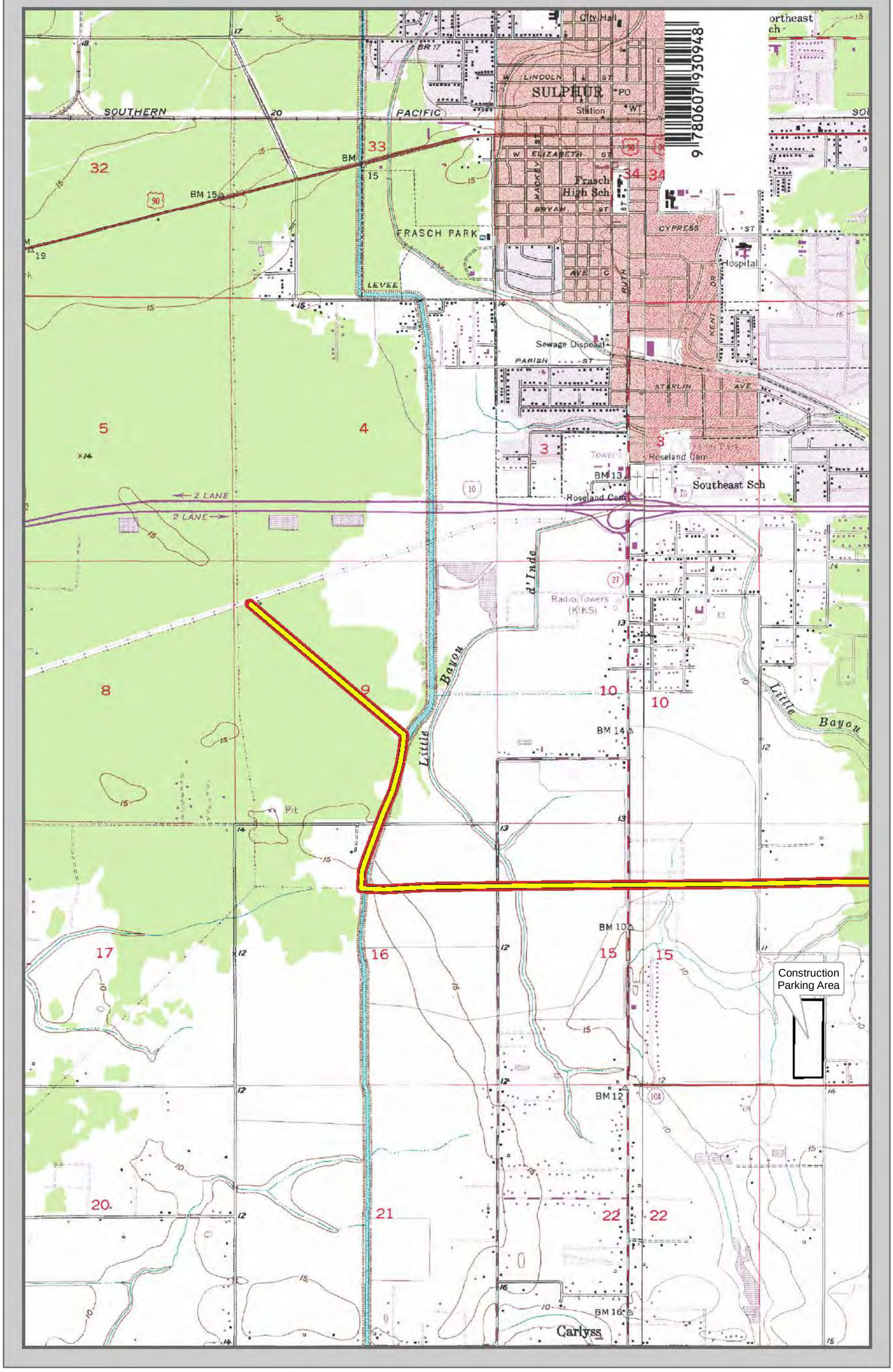


Figure 1-4
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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Enclosure 3

Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana

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Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
Lake Charles CCS Project (DOE proposes to fund)		
Carbon Capture and Compression (Calcasieu Parish, Louisiana)	• 2 acid gas removal units to capture CO_2 that would otherwise be emitted to the atmosphere • Produce CO_2 in the purity needed for sequestration or EOR • 2 CO_2 compressors pressurizing CO_2 to 2,250 psig for transport in a supercritical state • Monitoring and metering equipment • All equipment is completely contained within the LCC Gasification Project Site.	Phase I archaeological survey of known site within parcel previously conducted by URS in 2009; one cultural resources present (prehistoric archaeological site 16CU 29); site recommended not eligible for NRHP (letter report dated June 15, 2009 [Handley]). LA SHPO concurred with NRHP-eligibility recommendation; no further investigations of property required. (letter dated June 26, 2009 [Hutcheson]).
CO2 Pipeline (Calcasieu Parish, Louisiana)	• 11.1 mile pipeline from the CO_2 compressors to an existing CO_2 pipeline • Route includes a 50 foot permanent right of way (ROW) that would parallel existing ROWs (such as roadways, pipelines, railroads, transmission lines, and other linear features) throughout the length of the pipeline corridor to the extent practicable • CO_2 meter station at tie-in to existing CO2 pipeline (Green Pipeline)	Phase I cultural resources survey (for archaeological and architectural resources) by University of Alabama; two cultural resources identified (historic archaeological site 16CU73; and modern [late 20th century] Hardey Cemetery). Both resources recommended not eligible for NRHP; drilling pipeline beneath cemetery recommended for Hardey Cemetery (draft report dated November 18, 2011 [Watkins and Futato]). LA SHPO concurred with results of survey: no NRHP-eligible resources were identified within the APE; no historic properties will be impacted by the project; and no further work is necessary (letter dated April 25, 2012 [Breaux]).
LCCE Gasification Project (Connected Action, not under consideration for DOE funding)		

Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
Gasification Plant	• Provides CO_2 to the Lake Charles CCS Project • Petroleum coke gasification facility to produce methanol, hydrogen, and sulfuric acid on a 70 acre site in Calcasieu Parish • Site preparation of clearing, grading, raising the elevation currently being performed under USACE permit, including 26 acres of wetland mitigation implemented by the Port of Lake Charles • Construction expected to begin Fall 2012 and continue for 40 months	Phase I archaeological survey of known site within parcel previously conducted by URS in 2009; one cultural resources present (prehistoric archaeological site 16CU 29); site recommended not eligible for NRHP (letter report dated June 15, 2009 [Handley]). LA SHPO concurred with NRHP-eligibility recommendation and indicated no further investigations of property required (letter dated June 26, 2009 [Hutcheson]).
Offsite Activities	• 4 mile Raw Water Pipeline from Sabine River Canal. Route includes a 50 foot permanent ROW and 50 to 250 foot construction ROW that would parallel existing roadways, pipelines, railroads, transmission lines, and other linear features to the extent practicable. Leucadia would own and operate the raw water pipeline.	Phase IA cultural resources survey for archaeological and architectural resources) by URS; no cultural resources identified; further investigations of those areas that have not been previously disturbed or surveyed for cultural resources recommended (letter report dated May 16, 2012 [Handley]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• 8.5 mile Hydrogen Pipeline to transport hydrogen to Air Products in, Sulphur, Louisiana. Route includes a 50 foot permanent ROW and 75 foot construction ROW that would parallel existing roadways, pipelines, railroads, transmission lines, and other linear features to the extent practicable. The hydrogen pipeline would be owned and operated by Air Products.	Phase IA cultural resources survey (for archaeological and architectural resources) by URS; no cultural resources identified; further investigations of those areas that have not been previously disturbed or surveyed for cultural resources recommended (letter report dated May 16, 2012 [Handley]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.

Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
	• Offsite Construction Parking Area with shuttle buses to and from the Plant site. This site is partially cleared and graded.	Phase IA cultural resources survey (for archaeological and architectural resources) by URS; no previously recorded cultural resources identified within APE; further investigations of those areas that have not been previously disturbed or surveyed for cultural resources recommended (letter report dated May 16, 2012 [Handley]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Potable Water Pipeline to provide access to existing city water currently supplying the Port of Lake Charles. This work would take place within currently developed ROWs.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (letter report dated May 16, 2012 [Handley]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Natural Gas Pipeline to provide start up fuel. This work includes upgrade to an existing line and new line and would take place within currently developed ROWs.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Transmission Line to connect with the existing 230 kV transmission line. Route includes one alternative that would take place within currently developed ROWs on the east side of the Plant access road or on the west side of adjacent industrial property occupied by LA Pigment.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.

Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
	• Methanol and Sulfuric Acid Pipelines to Storage. These pipelines would transport products to the LCC Gasification Project offsite storage area. This work would take place within currently developed ROWs.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Construction Laydown Area for staging of construction equipment. This site would be located near LCC Gasification Project on property to be leased from the Port of Lake Charles. The site would be prepared for storage of construction equipment prior to use by Leucadia.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Methanol and Sulfuric Acid Storage Area and Pipelines to Port of Lake Charles. The area will contain above ground storage tanks for methanol and sulfuric acid. The pipelines move product from the storage area to offload by barge, ship, truck, and rail on the Port of Lake Charles property. The storage area and pipelines will be on property owned by the Port of Lake Charles.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.

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U.S. DEPARTMENT OF ENERGY

August 16, 2012

Kimberly Walden
Cultural Director
Chitimacha Tribe of Louisiana
P.O. Box 661
Charenton, LA 70523

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Ms. Walden:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Chitimacha Tribe of Louisiana on the portion of the proposed project in Louisiana.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

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As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the facilities associated with the Lake Charles CCS Project and its associated CO_2 capture and compression facilities in Calcasieu Parish, Louisiana;
- the Lake Charles CCS Project proposed 11.1-mile long CO_2 pipeline in Calcasieu Parish;
- the Lake Charles CCS Project proposed Research MVA program for the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation in Brazoria County, Texas; and,
- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (a connected action).

DOE has determined that the area of potential effects (APE) for the undertaking in Louisiana will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCCE Gasification that are located in Calcasieu Parish, Louisiana. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Louisiana is in an industrial setting on the west side of the Calcasieu River, and is in the vicinity of numerous energy-related facilities. The APE includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area
- the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest (see Enclosure 2).

Cultural resources investigations have been conducted within portions of the APE in Louisiana, including: Phase I archaeological survey of the property that contains the locations of the Lake Charles CCS Project and LCCE Gasification project; Phase I cultural resources survey of the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline, including extra workspace and access roads; and Phase IA cultural resources investigations of offsite facilities associated with the LCCE Gasification project (raw water, hydrogen, potable water, methanol and sulfuric acid pipelines; an overhead transmission line; a construction laydown area; and construction parking area). The reports documenting these cultural resources investigations have been submitted separately to the Louisiana SHPO for review and comment by the consultants on behalf of the Applicant. A table summarizing the cultural resources investigations is in Enclosure 3.

DOE has confirmed that no NRHP-listed historic properties or previously recorded standing structures or historic districts are located within the APE or a 0.5-mile radius around the APE in

Calcasieu Parish, Louisiana (NPS 2011a, 2011b; Louisiana Department of Culture, Recreation and Tourism 2011).

The DOE is also initiating Section 106 consultation with the Louisiana State Historic Preservation Officer to identify any issues or concerns regarding cultural resources and historic properties in the APE in Calcasieu Parish, Louisiana that may be affected by the proposed Project as part of the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800. Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), will be invited to participate in the Section 106 consultation process.

The DOE looks forward to receiving your comments or concerns regarding traditional cultural properties, sacred sites, or site of traditional religious or cultural importance in the APE that might be affected by the proposed Project and an indication as to whether you wish to participate in the Section 106 consultation for the proposed project. Please forward the results of your review and any requests for additional information to DOE's tribal liaison for the Project:

Jesse Garcia
NETL Tribal Liaison
Environmental Compliance Division
National Energy Technology Laboratory
3610 Collins Ferry Road
Mail Stop B07, Room 333
Morgantown, WV 26507
PH: 304-285-0256
Fax: 304-285-4403
Jesse.Garcia@NETL.doe.gov

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,

Jesse P. Garcia

For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Calcasieu Parish, Louisiana
3. Summary Table for Cultural Resources Investigations Conducted within the APE in Louisiana

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Handley, Martin. 2012. Letter dated May 16, 2012, from Martin Handley, Principal Investigator, URS Corporation, Baton Rouge, Louisiana, to Mr. Philip Leonards, Leucadia Energy, Houston, Texas. Re: *Cultural Resources Evaluation - Lake Charles Cogeneration, LLC (LCC), Calcasieu Parish, Louisiana*.

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Archaeological Site 16CU29, Lake Charles Gasification Facility, Lake Charles Cogeneration, LLC, Westlake, Calcasieu Parish, Louisiana.

URS Corporation. 2012. *Lake Charles Cogeneration, LLC, Cultural Resources Assessment, Calcasieu Parish, Louisiana*. URS Job No. 10003620, July 2012.

Watkins, Joel H. and Eugene M. Futato. 2011. *Phase I Cultural Resource Survey of the Proposed Lake Charles Pipeline Lateral Project located near Sulphur, Calcasieu Parish, Louisiana*. Draft report prepared November 21, 2011, by the University of Alabama, Office of Archaeological Research, Moundville, Alabama. Prepared for CH2M HILL, Atlanta, Georgia.

Same as Enclosures 1 through 3 per

August 16, 2012 Correspondence to the Caddo Nation

Regarding Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Calcasieu Parish, Louisiana (and Brazoria County, Texas)

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U.S. DEPARTMENT OF ENERGY

August 16, 2012

Terry Cole
Tribal Historic Preservation Officer
Choctaw Nation of Oklahoma
P.O. Box 1210
Durant, OK 74702

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Mr. Cole:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Choctaw Nation of Oklahoma on the portion of the proposed project in Louisiana.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

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As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

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- the Lake Charles CCS Project proposed 11.1-mile long CO_2 pipeline in Calcasieu Parish;
- the Lake Charles CCS Project proposed Research MVA program for the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation in Brazoria County, Texas; and,
- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (a connected action).

DOE has determined that the area of potential effects (APE) for the undertaking in Louisiana will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCCE Gasification that are located in Calcasieu Parish, Louisiana. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Louisiana is in an industrial setting on the west side of the Calcasieu River, and is in the vicinity of numerous energy-related facilities. The APE includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area
- the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest (see Enclosure 2).

Cultural resources investigations have been conducted within portions of the APE in Louisiana, including: Phase I archaeological survey of the property that contains the locations of the Lake Charles CCS Project and LCCE Gasification project; Phase I cultural resources survey of the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline, including extra workspace and access roads; and Phase IA cultural resources investigations of offsite facilities associated with the LCCE Gasification project (raw water, hydrogen, potable water, methanol and sulfuric acid pipelines; an overhead transmission line; a construction laydown area; and construction parking area). The reports documenting these cultural resources investigations have been submitted separately to the Louisiana SHPO for review and comment by the consultants on behalf of the Applicant. A table summarizing the cultural resources investigations is in Enclosure 3.

DOE has confirmed that no NRHP-listed historic properties or previously recorded standing structures or historic districts are located within the APE or a 0.5-mile radius around the APE in Calcasieu Parish, Louisiana (NPS 2011a, 2011b; Louisiana Department of Culture, Recreation and Tourism 2011).

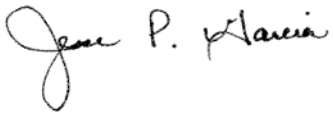
The DOE is also initiating Section 106 consultation with the Louisiana State Historic Preservation Officer to identify any issues or concerns regarding cultural resources and historic properties in the APE in Calcasieu Parish, Louisiana that may be affected by the proposed Project as part of the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800. Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), will be invited to participate in the Section 106 consultation process.

The DOE looks forward to receiving your comments or concerns regarding traditional cultural properties, sacred sites, or site of traditional religious or cultural importance in the APE that might be affected by the proposed Project and an indication as to whether you wish to participate in the Section 106 consultation for the proposed project. Please forward the results of your review and any requests for additional information to DOE's tribal liaison for the Project:

Jesse Garcia
NETL Tribal Liaison
Environmental Compliance Division
National Energy Technology Laboratory
3610 Collins Ferry Road
Mail Stop B07, Room 333
Morgantown, WV 26507
PH: 304-285-0256
Fax: 304-285-4403
Jesse.Garcia@NETL.doe.gov

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Calcasieu Parish, Louisiana
3. Summary Table for Cultural Resources Investigations Conducted within the APE in Louisiana

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Same as Enclosures 1 through 3 per

August 16, 2012 Correspondence to the Caddo Nation

Regarding Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Calcasieu Parish, Louisiana (and Brazoria County, Texas)

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NATIONAL ENERGY TECHNOLOGY LABORATORY
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U.S. DEPARTMENT OF ENERGY

August 16, 2012

Dr. Linda Langley
Cultural Preservation Officer
Coushatta Tribe of Louisiana
P.O. Box 818
Elton, LA 70532

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Dr. Langley:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Coushatta Tribe of Louisiana on the portion of the proposed project in Louisiana.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

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pierna.fayish@netl.doe.gov • Voice (412) 386-5428 • Fax (412) 386-4775 • www.netl.doe.gov

As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the facilities associated with the Lake Charles CCS Project and its associated CO_2 capture and compression facilities in Calcasieu Parish, Louisiana;
- the Lake Charles CCS Project proposed 11.1-mile long CO_2 pipeline in Calcasieu Parish;
- the Lake Charles CCS Project proposed Research MVA program for the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation in Brazoria County, Texas; and,
- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (a connected action).

DOE has determined that the area of potential effects (APE) for the undertaking in Louisiana will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCCE Gasification that are located in Calcasieu Parish, Louisiana. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Louisiana is in an industrial setting on the west side of the Calcasieu River, and is in the vicinity of numerous energy-related facilities. The APE includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area
- the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest (see Enclosure 2).

Cultural resources investigations have been conducted within portions of the APE in Louisiana, including: Phase I archaeological survey of the property that contains the locations of the Lake Charles CCS Project and LCCE Gasification project; Phase I cultural resources survey of the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline, including extra workspace and access roads; and Phase IA cultural resources investigations of offsite facilities associated with the LCCE Gasification project (raw water, hydrogen, potable water, methanol and sulfuric acid pipelines; an overhead transmission line; a construction laydown area; and construction parking area). The reports documenting these cultural resources investigations have been submitted separately to the Louisiana SHPO for review and comment by the consultants on behalf of the Applicant. A table summarizing the cultural resources investigations is in Enclosure 3.

DOE has confirmed that no NRHP-listed historic properties or previously recorded standing structures or historic districts are located within the APE or a 0.5-mile radius around the APE in

Calcasieu Parish, Louisiana (NPS 2011a, 2011b; Louisiana Department of Culture, Recreation and Tourism 2011).

The DOE is also initiating Section 106 consultation with the Louisiana State Historic Preservation Officer to identify any issues or concerns regarding cultural resources and historic properties in the APE in Calcasieu Parish, Louisiana that may be affected by the proposed Project as part of the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800. Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), will be invited to participate in the Section 106 consultation process.

The DOE looks forward to receiving your comments or concerns regarding traditional cultural properties, sacred sites, or site of traditional religious or cultural importance in the APE that might be affected by the proposed Project and an indication as to whether you wish to participate in the Section 106 consultation for the proposed project. Please forward the results of your review and any requests for additional information to DOE's tribal liaison for the Project:

Jesse Garcia
NETL Tribal Liaison
Environmental Compliance Division
National Energy Technology Laboratory
3610 Collins Ferry Road
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Morgantown, WV 26507
PH: 304-285-0256
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If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,

Jesse P. Garcia

For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
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Same as Enclosures 1 through 3 per

August 16, 2012 Correspondence to the Caddo Nation

Regarding Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Calcasieu Parish, Louisiana (and Brazoria County, Texas)

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NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA

U.S. DEPARTMENT OF ENERGY

August 16, 2012

Michael Tarpley
Tribal Historic Preservation Officer
Jena Band of Choctaw Indians
P.O.Box-14
Jena, LA 71342-0014

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Mr. Tarpley:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Jena Band of Choctaw Indians on the portion of the proposed project in Louisiana.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

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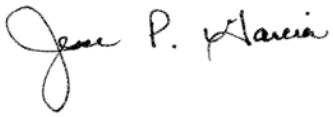
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Jesse Garcia
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Environmental Compliance Division
National Energy Technology Laboratory
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PH: 304-285-0256
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Jesse.Garcia@NETL.doe.gov

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

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Same as Enclosures 1 through 3 per

August 16, 2012 Correspondence to the Caddo Nation

Regarding Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Calcasieu Parish, Louisiana (and Brazoria County, Texas)

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NATIONAL ENERGY TECHNOLOGY LABORATORY
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U.S. DEPARTMENT OF ENERGY

August 16, 2012

Kenneth Carleton
Tribal Archaeologist & THPO
Mississippi Band of Choctaw Indians
P.O. Box 6257
Philadelphia, MS 39350

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Mr. Carleton:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Mississippi Band of Choctaw Indians on the portion of the proposed project in Louisiana.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

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As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the facilities associated with the Lake Charles CCS Project and its associated CO_2 capture and compression facilities in Calcasieu Parish, Louisiana;
- the Lake Charles CCS Project proposed 11.1-mile long CO_2 pipeline in Calcasieu Parish;
- the Lake Charles CCS Project proposed Research MVA program for the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation in Brazoria County, Texas; and,
- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (a connected action).

DOE has determined that the area of potential effects (APE) for the undertaking in Louisiana will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCCE Gasification that are located in Calcasieu Parish, Louisiana. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Louisiana is in an industrial setting on the west side of the Calcasieu River, and is in the vicinity of numerous energy-related facilities. The APE includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
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- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area
- the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest (see Enclosure 2).

Cultural resources investigations have been conducted within portions of the APE in Louisiana, including: Phase I archaeological survey of the property that contains the locations of the Lake Charles CCS Project and LCCE Gasification project; Phase I cultural resources survey of the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline, including extra workspace and access roads; and Phase IA cultural resources investigations of offsite facilities associated with the LCCE Gasification project (raw water, hydrogen, potable water, methanol and sulfuric acid pipelines; an overhead transmission line; a construction laydown area; and construction parking area). The reports documenting these cultural resources investigations have been submitted separately to the Louisiana SHPO for review and comment by the consultants on behalf of the Applicant. A table summarizing the cultural resources investigations is in Enclosure 3.

DOE has confirmed that no NRHP-listed historic properties or previously recorded standing structures or historic districts are located within the APE or a 0.5-mile radius around the APE in Calcasieu Parish, Louisiana (NPS 2011a, 2011b; Louisiana Department of Culture, Recreation and Tourism 2011).

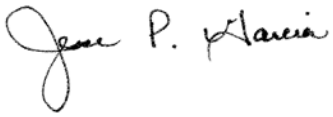
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The DOE looks forward to receiving your comments or concerns regarding traditional cultural properties, sacred sites, or site of traditional religious or cultural importance in the APE that might be affected by the proposed Project and an indication as to whether you wish to participate in the Section 106 consultation for the proposed project. Please forward the results of your review and any requests for additional information to DOE's tribal liaison for the Project:

Jesse Garcia
NETL Tribal Liaison
Environmental Compliance Division
National Energy Technology Laboratory
3610 Collins Ferry Road
Mail Stop B07, Room 333
Morgantown, WV 26507
PH: 304-285-0256
Fax: 304-285-4403
Jesse.Garcia@NETL.doe.gov

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Calcasieu Parish, Louisiana
3. Summary Table for Cultural Resources Investigations Conducted within the APE in Louisiana

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References:

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Same as Enclosures 1 through 3 per

August 16, 2012 Correspondence to the Caddo Nation

Regarding Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Calcasieu Parish, Louisiana (and Brazoria County, Texas)

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U.S. DEPARTMENT OF ENERGY

August 16, 2012

John Berrey
Chair
Quapaw Tribe of Oklahoma
P.O. Box 765
Quapaw, OK 74363-0765

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Mr. Berrey:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Quapaw Tribe of Oklahoma on the portion of the proposed project in Louisiana.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

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- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (a connected action).

DOE has determined that the area of potential effects (APE) for the undertaking in Louisiana will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCCE Gasification that are located in Calcasieu Parish, Louisiana. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

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Calcasieu Parish, Louisiana (NPS 2011a, 2011b; Louisiana Department of Culture, Recreation and Tourism 2011).

The DOE is also initiating Section 106 consultation with the Louisiana State Historic Preservation Officer to identify any issues or concerns regarding cultural resources and historic properties in the APE in Calcasieu Parish, Louisiana that may be affected by the proposed Project as part of the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800. Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), will be invited to participate in the Section 106 consultation process.

The DOE looks forward to receiving your comments or concerns regarding traditional cultural properties, sacred sites, or site of traditional religious or cultural importance in the APE that might be affected by the proposed Project and an indication as to whether you wish to participate in the Section 106 consultation for the proposed project. Please forward the results of your review and any requests for additional information to DOE's tribal liaison for the Project:

Jesse Garcia
NETL Tribal Liaison
Environmental Compliance Division
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3610 Collins Ferry Road
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PH: 304-285-0256
Fax: 304-285-4403
Jesse.Garcia@NETL.doe.gov

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,

Jesse P. Garcia

For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Calcasieu Parish, Louisiana
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Same as Enclosures 1 through 3 per

August 16, 2012 Correspondence to the Caddo Nation

Regarding Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Calcasieu Parish, Louisiana (and Brazoria County, Texas)

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NATIONAL ENERGY TECHNOLOGY LABORATORY
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U.S. DEPARTMENT OF ENERGY

August 16, 2012

Alan Emarthle
Historic Preservation Officer
Seminole Nation of Oklahoma
P.O. Box 1498
Wewoka, OK 74884

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Mr. Emarthle:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Seminole Nation of Oklahoma on the portion of the proposed project in Louisiana.

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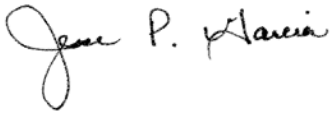
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PH: 304-285-0256
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If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

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Same as Enclosures 1 through 3 per

August 16, 2012 Correspondence to the Caddo Nation

Regarding Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Calcasieu Parish, Louisiana (and Brazoria County, Texas)

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U.S. DEPARTMENT OF ENERGY

August 16, 2012

Willard Steele
Tribal Historic Preservation Officer
Seminole Tribe of Florida
30290 Josie Billie Hwy
PMB 1004
Clewiston, FL 33440

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Mr. Steele:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Seminole Tribe of Florida on the portion of the proposed project in Louisiana.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of

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the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.
As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the facilities associated with the Lake Charles CCS Project and its associated CO_2 capture and compression facilities in Calcasieu Parish, Louisiana;
- the Lake Charles CCS Project proposed 11.1-mile long CO_2 pipeline in Calcasieu Parish;
- the Lake Charles CCS Project proposed Research MVA program for the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation in Brazoria County, Texas; and,
- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (a connected action).

DOE has determined that the area of potential effects (APE) for the undertaking in Louisiana will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCCE Gasification that are located in Calcasieu Parish, Louisiana. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Louisiana is in an industrial setting on the west side of the Calcasieu River, and is in the vicinity of numerous energy-related facilities. The APE includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area
- the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest (see Enclosure 2).

Cultural resources investigations have been conducted within portions of the APE in Louisiana, including: Phase I archaeological survey of the property that contains the locations of the Lake Charles CCS Project and LCCE Gasification project; Phase I cultural resources survey of the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline, including extra workspace and access roads; and Phase IA cultural resources investigations of offsite facilities associated with the LCCE Gasification project (raw water, hydrogen, potable water, methanol and sulfuric acid pipelines; an overhead transmission line; a construction laydown area; and construction parking area). The reports documenting these cultural resources investigations have been submitted separately to the Louisiana SHPO for review and comment by the consultants on behalf of the Applicant. A table summarizing the cultural resources investigations is in Enclosure 3.

DOE has confirmed that no NRHP-listed historic properties or previously recorded standing structures or historic districts are located within the APE or a 0.5-mile radius around the APE in Calcasieu Parish, Louisiana (NPS 2011a, 2011b; Louisiana Department of Culture, Recreation and Tourism 2011).

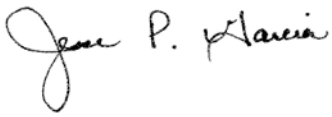
The DOE is also initiating Section 106 consultation with the Louisiana State Historic Preservation Officer to identify any issues or concerns regarding cultural resources and historic properties in the APE in Calcasieu Parish, Louisiana that may be affected by the proposed Project as part of the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800. Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), will be invited to participate in the Section 106 consultation process.

The DOE looks forward to receiving your comments or concerns regarding traditional cultural properties, sacred sites, or site of traditional religious or cultural importance in the APE that might be affected by the proposed Project and an indication as to whether you wish to participate in the Section 106 consultation for the proposed project. Please forward the results of your review and any requests for additional information to DOE's tribal liaison for the Project:

Jesse Garcia
NETL Tribal Liaison
Environmental Compliance Division
National Energy Technology Laboratory
3610 Collins Ferry Road
Mail Stop B07, Room 333
Morgantown, WV 26507
PH: 304-285-0256
Fax: 304-285-4403
Jesse.Garcia@NETL.doe.gov

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Calcasieu Parish, Louisiana

3. Summary Table for Cultural Resources Investigations Conducted within the APE in Louisiana

References:

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Same as Enclosures 1 through 3 per

August 16, 2012 Correspondence to the Caddo Nation

Regarding Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Calcasieu Parish, Louisiana (and Brazoria County, Texas)

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U.S. DEPARTMENT OF ENERGY

August 16, 2012

Earl J. Barbry, Jr.
Tribal Historic Preservation Officer
Tunica-Biloxi Tribe of Louisiana
Attn: Museum Division Offices
P.O. Box 1589
Marksville, LA 71351

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Mr. Barbry:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Tunica-Biloxi Tribe of Louisiana on the portion of the proposed project in Louisiana.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation.

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A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the facilities associated with the Lake Charles CCS Project and its associated CO_2 capture and compression facilities in Calcasieu Parish, Louisiana;
- the Lake Charles CCS Project proposed 11.1-mile long CO_2 pipeline in Calcasieu Parish;
- the Lake Charles CCS Project proposed Research MVA program for the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation in Brazoria County, Texas; and,
- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (a connected action).

DOE has determined that the area of potential effects (APE) for the undertaking in Louisiana will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCCE Gasification that are located in Calcasieu Parish, Louisiana. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Louisiana is in an industrial setting on the west side of the Calcasieu River, and is in the vicinity of numerous energy-related facilities. The APE includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area
- the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest (see Enclosure 2).

Cultural resources investigations have been conducted within portions of the APE in Louisiana, including: Phase I archaeological survey of the property that contains the locations of the Lake Charles CCS Project and LCCE Gasification project; Phase I cultural resources survey of the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline, including extra workspace and access roads; and Phase IA cultural resources investigations of offsite facilities associated with the LCCE Gasification project (raw water, hydrogen, potable water, methanol and sulfuric acid pipelines; an overhead transmission line; a construction laydown area; and construction parking area). The reports documenting these cultural resources investigations have been submitted separately to the Louisiana SHPO for review and comment by the consultants on behalf of the Applicant. A table summarizing the cultural resources investigations is in Enclosure 3.

DOE has confirmed that no NRHP-listed historic properties or previously recorded standing structures or historic districts are located within the APE or a 0.5-mile radius around the APE in Calcasieu Parish, Louisiana (NPS 2011a, 2011b; Louisiana Department of Culture, Recreation and Tourism 2011).

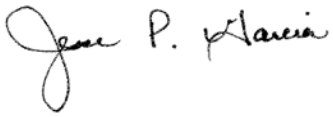
The DOE is also initiating Section 106 consultation with the Louisiana State Historic Preservation Officer to identify any issues or concerns regarding cultural resources and historic properties in the APE in Calcasieu Parish, Louisiana that may be affected by the proposed Project as part of the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800. Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), will be invited to participate in the Section 106 consultation process.

The DOE looks forward to receiving your comments or concerns regarding traditional cultural properties, sacred sites, or site of traditional religious or cultural importance in the APE that might be affected by the proposed Project and an indication as to whether you wish to participate in the Section 106 consultation for the proposed project. Please forward the results of your review and any requests for additional information to DOE's tribal liaison for the Project:

Jesse Garcia
NETL Tribal Liaison
Environmental Compliance Division
National Energy Technology Laboratory
3610 Collins Ferry Road
Mail Stop B07, Room 333
Morgantown, WV 26507
PH: 304-285-0256
Fax: 304-285-4403
Jesse.Garcia@NETL.doe.gov

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Calcasieu Parish, Louisiana
3. Summary Table for Cultural Resources Investigations Conducted within the APE in Louisiana

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References:

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Same as Enclosures 1 through 3 per

August 16, 2012 Correspondence to the Caddo Nation

Regarding Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Calcasieu Parish, Louisiana (and Brazoria County, Texas)

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U.S. DEPARTMENT OF ENERGY

August 16, 2012

Bryant Celestine
Historic Preservation Officer
Alabama Coushatta Tribe of Texas
571 State Park Rd. 56
Livingston, TX 77351

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana and Brazoria County, Texas

Dear Mr. Celestine:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Alabama Coushatta Tribe of Texas on the proposed project.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

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As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

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- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (a connected action).

DOE has determined that the area of potential effects (APE) for the undertaking will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCCE Gasification, which are located in Calcasieu Parish, Louisiana and in Brazoria County, Texas. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Louisiana is in an industrial setting on the west side of the Calcasieu River, and is in the vicinity of numerous energy-related facilities. The APE includes the locations of:

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- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area
- the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest (see Enclosure 2).

Cultural resources investigations have been conducted within portions of the APE in Louisiana, including: Phase I archaeological survey of the property that contains the locations of the Lake Charles CCS Project and LCCE Gasification project; Phase I cultural resources survey of the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline, including extra workspace and access roads; and Phase IA cultural resources investigations of offsite facilities associated with the LCCE Gasification project (raw water, hydrogen, potable water, methanol and sulfuric acid pipelines; an overhead transmission line; a construction laydown area; and construction parking area). The reports documenting these cultural resources investigations have been submitted separately to the Louisiana SHPO for review and comment by the consultants on behalf of the Applicant. A table summarizing the cultural resources investigations is in Enclosure 3.

The APE in Texas includes the location of the proposed CO_2 sequestration in an ongoing commercial enhanced oil recovery operation and Research MVA program at the existing Hastings Oil Field in Brazoria County, Texas (see Enclosure 4).

A records and literature search of the area within the MVA portion of the APE in Brazoria County, Texas was conducted by William Self Associates, Inc. (WSA) in October 2011. The letter report documenting the results of the records and literature search was submitted separately to the Texas SHPO for review and comment by the consultants on behalf of the Applicant. A summary of this cultural resources investigation is also in Enclosure 3.

DOE has confirmed that no NRHP-listed historic properties or previously recorded standing structures or historic districts are located within the APE or a 0.5-mile radius around the APE in Calcasieu Parish, Louisiana (NPS 2011a, 2011b; Louisiana Department of Culture, Recreation and Tourism 2011). DOE has also confirmed that no NRHP-listed historic properties or districts, neighborhood surveys, historical markers, cemeteries, museums, historic county courthouses, military sites, or state archaeological landmarks (buildings only) are within the APE or a 0.5 mile radius around the APE in Brazoria County, Texas (NPS 2011a, 2011b; Texas Historical Commission 2011).

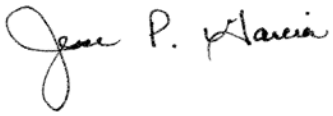
The DOE is also initiating Section 106 consultation with the Louisiana and Texas State Historic Preservation Officers to identify any issues or concerns regarding cultural resources and historic properties in the APE in Calcasieu Parish, Louisiana and Brazoria County, Texas, respectively, that may be affected by the proposed Project as part of the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800. Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), will be invited to participate in the Section 106 consultation process.

The DOE looks forward to receiving your comments or concerns regarding traditional cultural properties, sacred sites, or site of traditional religious or cultural importance in the APE that might be affected by the proposed Project and an indication as to whether you wish to participate in the Section 106 consultation for the proposed project. Please forward the results of your review and any requests for additional information to DOE's tribal liaison for the Project:

Jesse Garcia
NETL Tribal Liaison
Environmental Compliance Division
National Energy Technology Laboratory
3610 Collins Ferry Road
Mail Stop B07, Room 333
Morgantown, WV 26507
PH: 304-285-0256
Fax: 304-285-4403
Jesse.Garcia@NETL.doe.gov

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Calcasieu Parish, Louisiana
3. Summary Table for Cultural Resources Investigations Conducted within the APE in Louisiana and Texas
4. APE for proposed Lake Charles CCS Project facilities in Brazoria County, Texas

References:

Breaux, Pam. 2012. Letter dated April 25, 2012, from Pam Breaux, State Historic Preservation Officer, Office of Cultural Development, Louisiana Department of Culture, Recreation & Tourism, Baton Rouge, Louisiana, to Joel Watkins, Cultural Resource Analyst, Office of Archaeological Research, Moundville, Alabama. RE: *Draft Report, La Division of Archaeology Report No. 22-4007, Phase I Cultural Resource Survey of the Proposed Lake Charles Pipeline Lateral Project located near Sulphur, Calcasieu Parish, Louisiana*.

Handley, Martin. 2009. Letter dated June 15, 2009, from Martin Handley, Principal Investigator, URS Corporation, Baton Rouge, Louisiana, to Mr. Donald W. Maley, Vice-President, Lake Charles Cogeneration, LLC, Houston, Texas. RE: *Field Assessment of Archaeological Site 16CU29, Lake Charles Gasification Facility, Lake Charles Cogeneration, LLC, Westlake, Calcasieu Parish, Louisiana*.

Handley, Martin. 2012. Letter dated May 16, 2012, from Martin Handley, Principal Investigator, URS Corporation, Baton Rouge, Louisiana, to Mr. Philip Leonards, Leucadia Energy, Houston, Texas. Re: *Cultural Resources Evaluation - Lake Charles Cogeneration, LLC (LCC), Calcasieu Parish, Louisiana*.

Hutcheson, Scott. 2009. Letter dated June 26, 2009, from Scott Hutcheson, State Historic Preservation Officer, Office of Cultural Development, Department of Culture, Recreation and Tourism, State of Louisiana, Baton Rouge, Louisiana. RE: *Lake Charles Gasification Facility, Lake Charles Cogeneration LLC, Agency Interest No. 160213, Activity No. PER20090001, Lake Charles, Calcasieu Parish, LA.*

Karbula, James W., Ph.D. 2011. Letter dated October 25, 2011, from Dr. James W. Karbula, Regional Project Director, William Self Associates, Inc., Austin, Texas, to Patricia Mercado-Allinger, State Archaeologist, Archeology Division, Texas Historical Commission, Austin, Texas. Re: *Denbury Onshore, LLC, CO2 Sequestration Monitoring, Verification, and Accounting (MVA), Hastings Field, Brazoria County, Texas*.

Louisiana Department of Culture, Recreation and Tourism. 2011a. Louisiana Cultural Resources Map: Standing Structures and Historic Districts within 0.5 miles of Project Areas in Calcasieu Parish, Louisiana. http://kronos.crt.state.la.us/website/lahpweb/viewer.htm (web site accessed March 7, 2011).

National Park Service. 2011a. National Historic Landmarks Program, Lists of National Historic Landmarks: National Historic Landmarks Survey, Listing of National Historic Landmarks by State: Louisiana and Texas. http://www.nps.gov/history/nhl/designations/Lists/LA01.pdf and http://www.nps.gov/history/nhl/designations/Lists/TX01.pdf (web sites accessed March 7, 2011).

National Park Service. 2011b. National Register of Historic Places, NPS Focus: Calcasieu Parish, Louisiana and Brazoria County, Texas. http://nrhp.focus.nps.gov/natreghome.do (web site accessed March 7, 2011).

Smith, R. L., M. E. Weed, A. I. Wilson, and A. Deter-Wolf. 2001. *Intensive Cultural Resources Survey – Citgo Petroleum Corporation, Lake Charles Refinery, Calcasieu Parish, Louisiana*. Report No. 22-2382, on file, Louisiana Division of Archaeology, Baton Rouge, Louisiana. Cited in letter dated June 15, 2009, from Martin Handley, Principal Investigator, URS Corporation, Baton Rouge, Louisiana, to Mr. Donald W. Maley, Vice-President, Lake Charles Cogeneration, LLC, Houston, Texas. RE: *Field Assessment of Archaeological Site 16CU29, Lake Charles Gasification Facility, Lake Charles Cogeneration, LLC, Westlake, Calcasieu Parish, Louisiana*.

Texas Historical Commission. 2011. Texas Historic Sites Atlas. http://atlas.thc.state.tx.us/shell-map-address.htm (web site accessed March 7, 2011).

URS Corporation. 2012. *Lake Charles Cogeneration, LLC, Cultural Resources Assessment, Calcasieu Parish, Louisiana*. URS Job No. 10003620, July 2012.

Watkins, Joel H. and Eugene M. Futato. 2011. *Phase I Cultural Resource Survey of the Proposed Lake Charles Pipeline Lateral Project located near Sulphur, Calcasieu Parish, Louisiana*. Draft report prepared November 21, 2011, by the University of Alabama, Office of Archaeological Research, Moundville, Alabama. Prepared for CH2M HILL, Atlanta, Georgia.

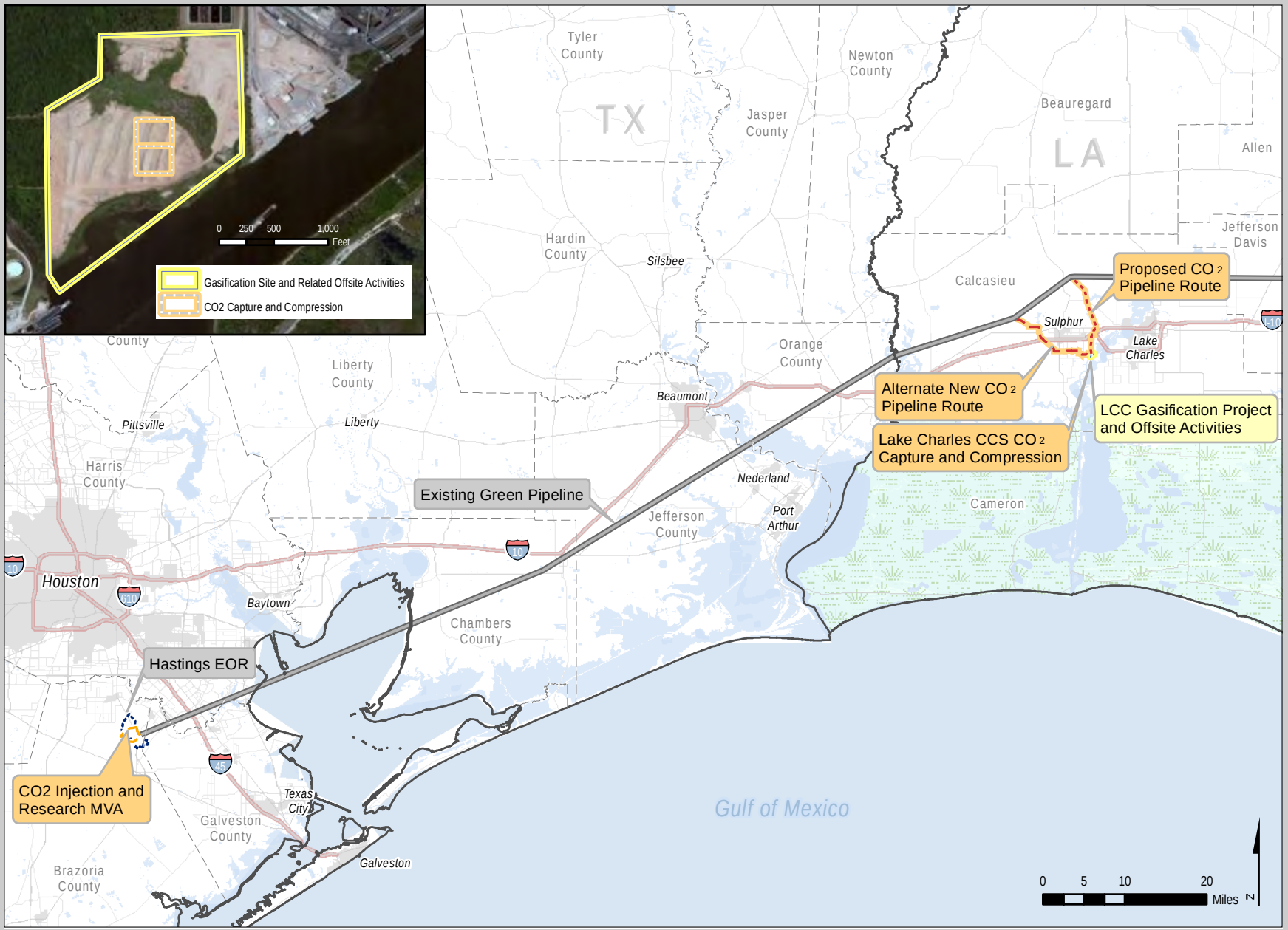
Wolfe, Mark. 2011. Letter dated November 1, 2011, from Mark Wolfe, State Historic Preservation Officer, Texas Historical Commission, Austin, Texas, to James Karbula, William Self Associates, Inc., Austin, Texas. Re: *Project Review under Section 106 of the National Historic Preservation act of 1966 and the Antiquities Code of Texas, Denbury Onshore, LLC, CO2 Sequestration Monitoring, Verification, and Accounting (MVA), Hastings Field, Brazoria County, Texas*.

Enclosure 1

Location of the Proposed
Lake Charles Carbon Capture and Sequestration Project

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Lake Charles CCS Project (Proposed Project)

- Alternative CO2 Pipeline Route
- Proposed CO2 Pipeline Route
- CO2 Capture and Compression
- CO2 injection and Research MVA

LCC Gasification Project (Connected Action)

- Gasification Site and Related Offsite Activities

Existing EOR Operations

- Green Pipeline
- Hastings EOR
- State Boundary
- County Boundary
- Major waterbody

Figure 2.2-1
Lake Charles CCS Project
Overall Location
Texas and Louisiana

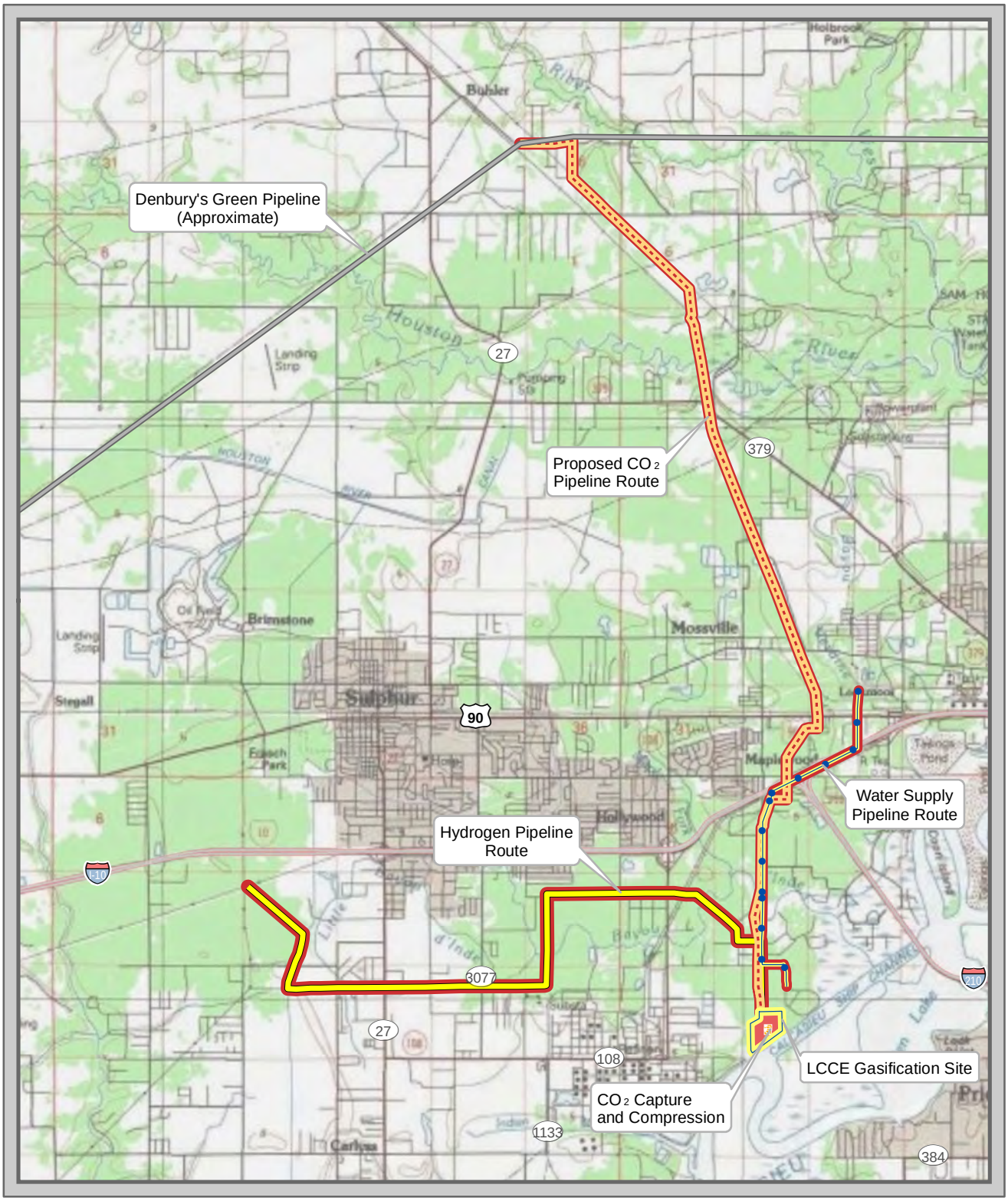
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Enclosure 2

Area of Potential Effect
for Proposed Lake Charles Carbon Capture and Sequestration Project Facilities
in Calcasieu Parish, Louisiana

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N

0 0.25 0.5 1 Miles

Area of Potential Effect (APE)

Lake Charles CCS Project (Proposed Action)

Alternative CO2 Pipeline Route

CO2 Capture and Compression

Proposed CO2 Pipeline Route

Existing Operations (Not in Project or Proposed Action)

Green Pipeline

LCCE Gasification Project (Connected Action)

Gasification Site and Related Offsite Activities

Water Supply Pipeline Route

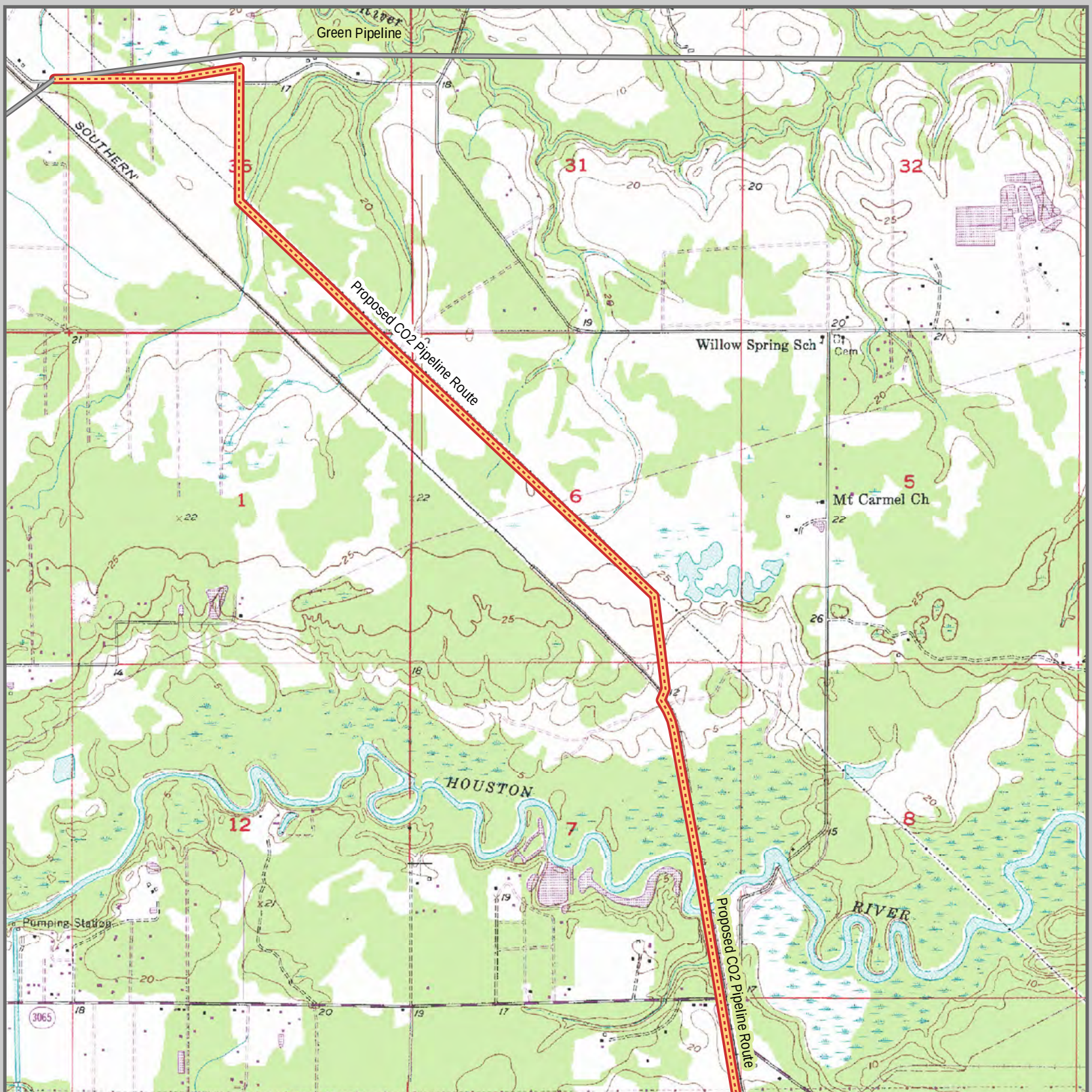
Hydrogen Pipeline Route

Figure 1
Overview of the APE (Area of Potential Effect) for the Proposed Facilities within Calcasieu Parish, Louisiana

Source: USGS 1:24,000 Friendswood (1998); Pearland (1983); Manval (1977); and Algoa (1977) Quadrangles.

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N

0 0.125 0.25 0.5 Miles

Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Area of Potential Effect (APE)

Existing Operations (Not in Project or Proposed Action)

Green Pipeline

Lake Charles CCS Project (Proposed Action)

CO2 Capture and Compression

Proposed CO2 Pipeline Route

Lake Charles Gasification Project (Connected Action)

Gasification Site

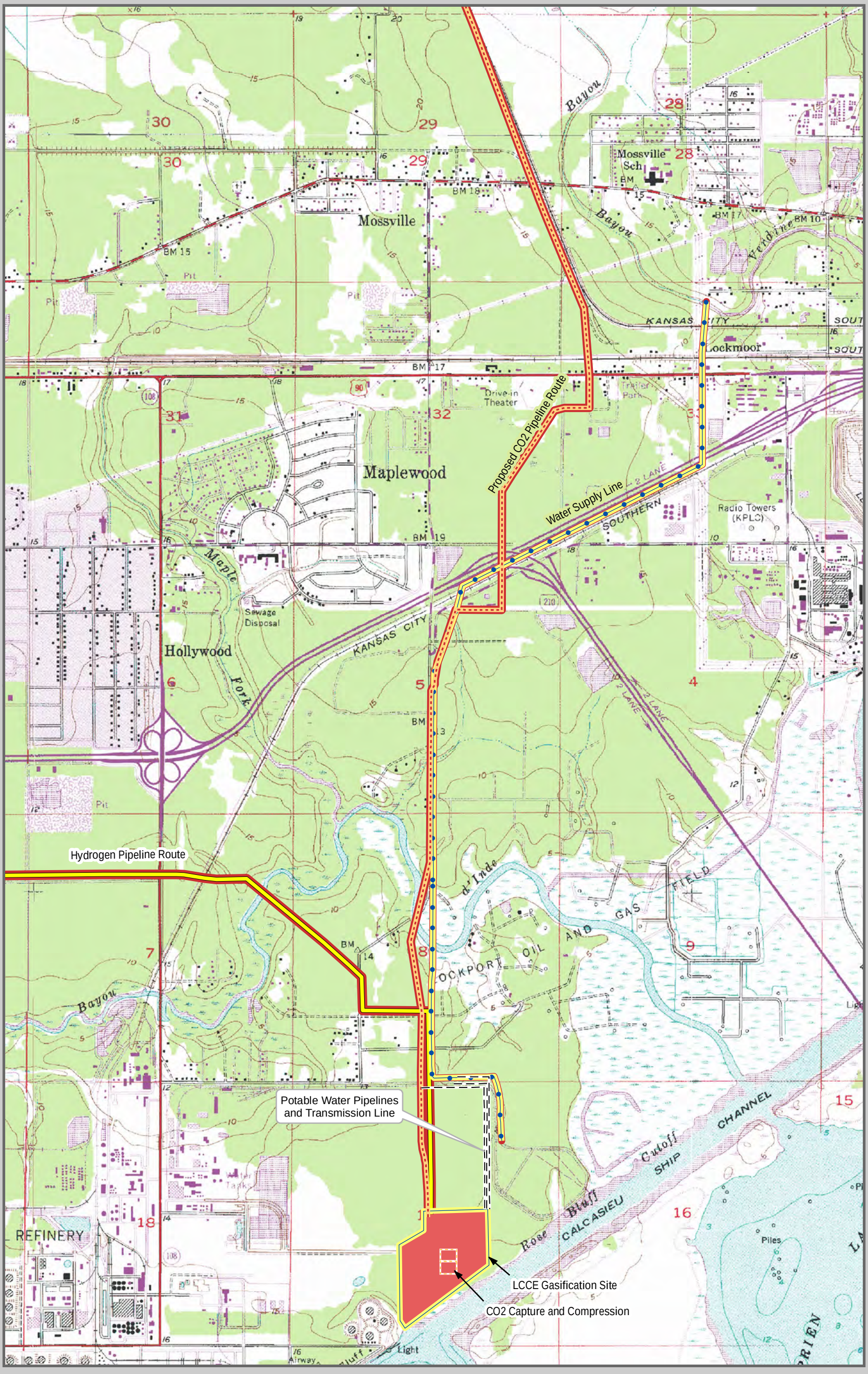
Water Supply Line

Hydrogen Pipeline Route

Figure 1-1
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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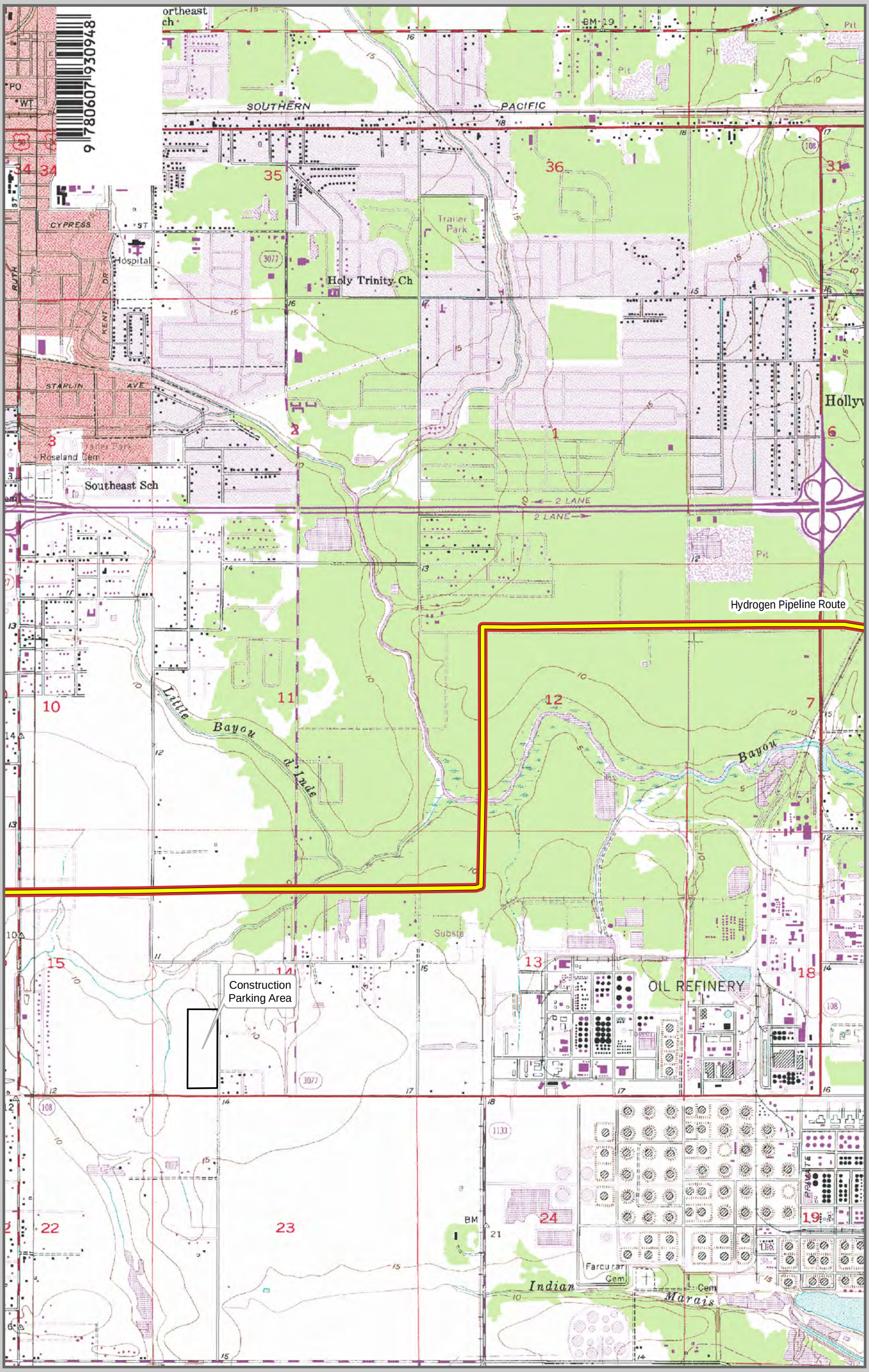


Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Figure 1-2
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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N

0 0.125 0.25 0.5 Miles

Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Area of Potential Effect (APE)

Existing Operations (Not in Project or Proposed Action)

Green Pipeline

Lake Charles CCS Project (Proposed Action)

CO2 Capture and Compression

Proposed CO2 Pipeline Route

Lake Charles Gasification Project (Connected Action)

Gasification Site

Water Supply Line

Hydrogen Pipeline Route

Figure 1-3

APE (Area of Potential Effect) for the Proposed Facilities within

Calcasieu Parish, Louisiana

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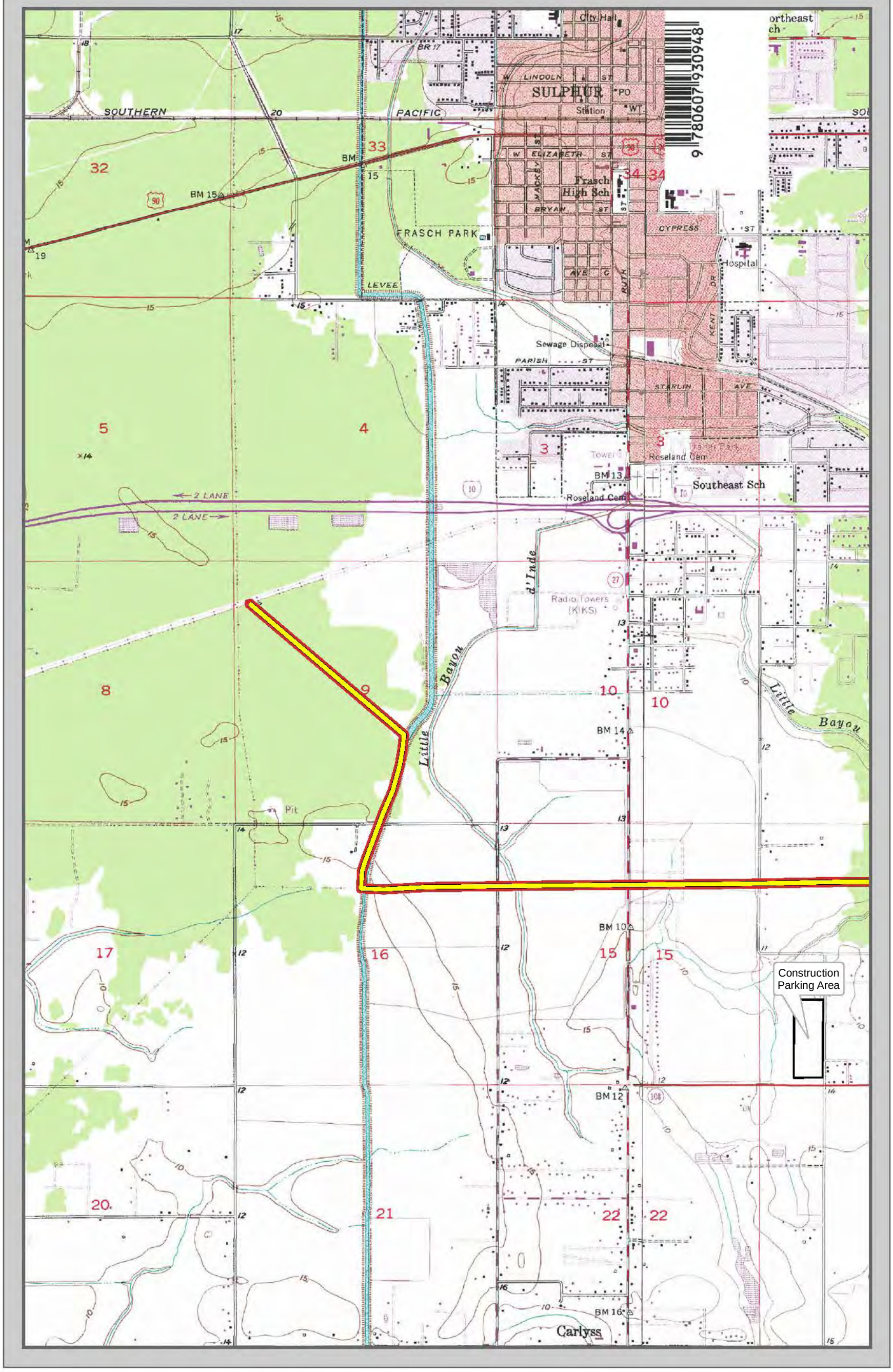


Figure 1-4
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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Enclosure 3

Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana and Texas

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Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana and Texas

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
Lake Charles CCS Project (DOE proposes to fund)		
Carbon Capture and Compression (Calcasieu Parish, Louisiana)	• 2 acid gas removal units to capture CO_2 that would otherwise be emitted to the atmosphere • Produce CO_2 in the purity needed for sequestration or EOR • 2 CO_2 compressors pressurizing CO_2 to 2,250 psig for transport in a supercritical state • Monitoring and metering equipment • All equipment is completely contained within the LCC Gasification Project Site.	Phase I archaeological survey of known site within parcel previously conducted by URS in 2009; one cultural resources present (prehistoric archaeological site 16CU 29); site recommended not eligible for NRHP (letter report dated June 15, 2009 [Handley]). LA SHPO concurred with NRHP-eligibility recommendation; no further investigations of property required. (letter dated June 26, 2009 [Hutcheson]).
CO2 Pipeline (Calcasieu Parish, Louisiana)	• 11.1 mile pipeline from the CO_2 compressors to an existing CO_2 pipeline • Route includes a 50 foot permanent right of way (ROW) that would parallel existing ROWs (such as roadways, pipelines, railroads, transmission lines, and other linear features) throughout the length of the pipeline corridor to the extent practicable • CO_2 meter station at tie-in to existing CO2 pipeline (Green Pipeline)	Phase I cultural resources survey (for archaeological and architectural resources) by University of Alabama; two cultural resources identified (historic archaeological site 16CU73; and modern [late 20th century] Hardey Cemetery). Both resources recommended not eligible for NRHP; drilling pipeline beneath cemetery recommended for Hardey Cemetery (draft report dated November 18, 2011 [Watkins and Futato]). LA SHPO concurred with results of survey: no NRHP-eligible resources were identified within the APE; no historic properties will be impacted by the project; and no further work is necessary (letter dated April 25, 2012 [Breaux]).

Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana and Texas

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
Research MVA program (Brazoria County, Texas)	• CO_2 sequestration monitoring locations in existing Hastings Oil Field	Phase IA cultural resources survey for archaeological and architectural resources) by WSA; no cultural resources identified; location has been previously disturbed during development of Hastings Oil Field; no further surveys for cultural resources recommended (letter report dated October 25, 2011 [Karbula]). TX SHPO concurred with recommendation and indicated no further investigations of property required (letter dated November 1, 2011 [Wolfe]).
LCCE Gasification Project (Connected Action, not under consideration for DOE funding)		
Gasification Plant	• Provides CO_2 to the Lake Charles CCS Project • Petroleum coke gasification facility to produce methanol, hydrogen, and sulfuric acid on a 70 acre site in Calcasieu Parish • Site preparation of clearing, grading, raising the elevation currently being performed under USACE permit, including 26 acres of wetland mitigation implemented by the Port of Lake Charles • Construction expected to begin Fall 2012 and continue for 40 months	Phase I archaeological survey of known site within parcel previously conducted by URS in 2009; one cultural resources present (prehistoric archaeological site 16CU 29); site recommended not eligible for NRHP (letter report dated June 15, 2009 [Handley]). LA SHPO concurred with NRHP-eligibility recommendation and indicated no further investigations of property required (letter dated June 26, 2009 [Hutcheson]).
Offsite Activities	• 4 mile Raw Water Pipeline from Sabine River Canal. Route includes a 50 foot permanent ROW and 50 to 250 foot construction ROW that would parallel existing roadways, pipelines, railroads, transmission lines, and other linear features to the extent practicable. Leucadia would own and operate the raw water pipeline.	Phase IA cultural resources survey for archaeological and architectural resources) by URS; no cultural resources identified; further investigations of those areas that have not been previously disturbed or surveyed for cultural resources recommended (letter report dated May 16, 2012 [Handley]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.

Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana and Texas

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
	• 8.5 mile Hydrogen Pipeline to transport hydrogen to Air Products in, Sulphur, Louisiana. Route includes a 50 foot permanent ROW and 75 foot construction ROW that would parallel existing roadways, pipelines, railroads, transmission lines, and other linear features to the extent practicable. The hydrogen pipeline would be owned and operated by Air Products.	Phase IA cultural resources survey (for archaeological and architectural resources) by URS; no cultural resources identified; further investigations of those areas that have not been previously disturbed or surveyed for cultural resources recommended (letter report dated May 16, 2012 [Handley]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Offsite Construction Parking Area with shuttle buses to and from the Plant site. This site is partially cleared and graded.	Phase IA cultural resources survey (for archaeological and architectural resources) by URS; no previously recorded cultural resources identified within APE; further investigations of those areas that have not been previously disturbed or surveyed for cultural resources recommended (letter report dated May 16, 2012 [Handley]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Potable Water Pipeline to provide access to existing city water currently supplying the Port of Lake Charles. This work would take place within currently developed ROWs.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (letter report dated May 16, 2012 [Handley]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Natural Gas Pipeline to provide start up fuel. This work includes upgrade to an existing line and new line and would take place within currently developed ROWs.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.

Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana and Texas

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
	• Transmission Line to connect with the existing 230 kV transmission line. Route includes one alternative that would take place within currently developed ROWs on the east side of the Plant access road or on the west side of adjacent industrial property occupied by LA Pigment.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Methanol and Sulfuric Acid Pipelines to Storage. These pipelines would transport products to the LCC Gasification Project offsite storage area. This work would take place within currently developed ROWs.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Construction Laydown Area for staging of construction equipment. This site would be located near LCC Gasification Project on property to be leased from the Port of Lake Charles. The site would be prepared for storage of construction equipment prior to use by Leucadia.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.

Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana and Texas

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
	• Methanol and Sulfuric Acid Storage Area and Pipelines to Port of Lake Charles. The area will contain above ground storage tanks for methanol and sulfuric acid. The pipelines move product from the storage area to offload by barge, ship, truck, and rail on the Port of Lake Charles property. The storage area and pipelines will be on property owned by the Port of Lake Charles.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.

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Enclosure 4

Area of Potential Effect
for Proposed Lake Charles Carbon Capture and Sequestration Project Facilities
in Brazoria County, Texas

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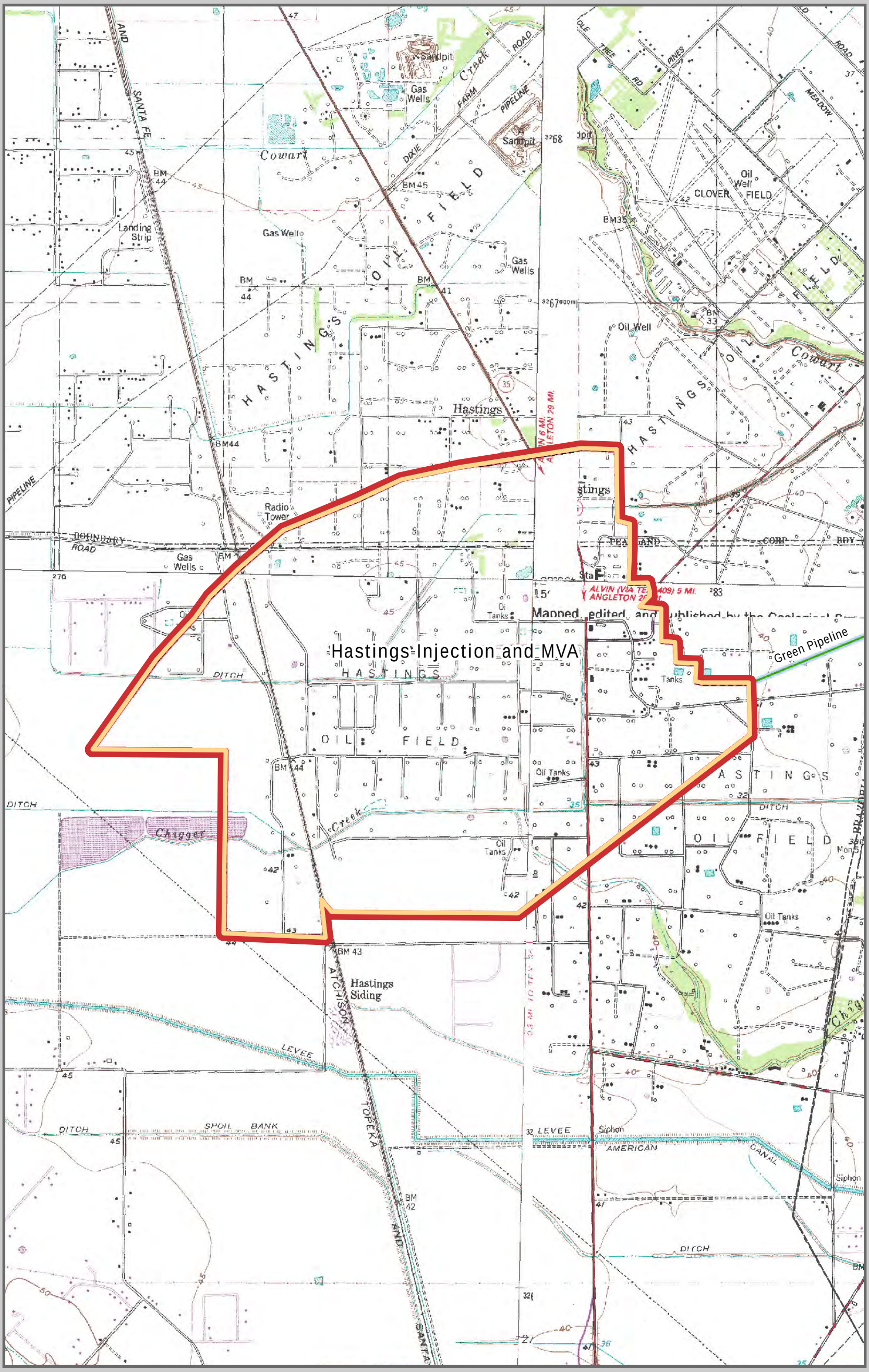


Figure 2
APE (Area of Potential Effect) for the Proposed AGR and Compression Site
Calcasieu Parish, Louisiana

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NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA

U.S. DEPARTMENT OF ENERGY

August 16, 2012

Juan Garza, Jr.
Chairman
Kickapoo Traditional Tribe of Texas
HC 1, Box 9700
Eagle Pass, TX 78852

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Brazoria County, Texas (and Calcasieu Parish, Louisiana)

Dear Mr. Garza:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Kickapoo Traditional Tribe of Texas on the proposed project.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

626 Cochrans Mill Road, P.O. Box 10940, Pittsburgh, PA 15236
pierna.fayish@netl.doe.gov • Voice (412) 386-5428 • Fax (412) 386-4775 • www.netl.doe.gov

As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the facilities associated with the Lake Charles CCS Project and its associated CO_2 capture and compression facilities in Calcasieu Parish, Louisiana;
- the Lake Charles CCS Project proposed 11.1-mile long CO_2 pipeline in Calcasieu Parish;
- the Lake Charles CCS Project proposed Research MVA program for the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation in Brazoria County, Texas; and,
- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (a connected action).

DOE has determined that the area of potential effects (APE) for the undertaking in Texas will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project that are located in Brazoria County, Texas. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Texas includes the location of the proposed CO_2 sequestration in an ongoing commercial enhanced oil recovery operation and Research MVA program at the existing Hastings Oil Field in Brazoria County, Texas (see Enclosure 2).

In October 2011, William Self Associates, Inc. (WSA) conducted a records and literature search of the area within the Research MVA portion of the APE for the proposed action (Karbula 2011). The results of this records and literature search were sent to your office on October 25, 2011 and are included in Enclosure 3. The purpose of the records and literature search by WSA was to determine the presence of previously identified cultural resources and historic properties within the Research MVA portion of the APE; to determine the extent of previous and existing disturbance and development within the Research MVA portion of the APE; and to evaluate the potential sensitivity of the Research MVA portion of the APE for unidentified cultural resources or historic properties. Results of the records and literature search by WSA indicated that there are no recorded archaeological sites, cemeteries, NRHP properties, State Archaeological Landmarks (SAL) or markers within the Research MVA portion of the APE. Because the Hastings Oil Field is a highly disturbed landscape resulting from decades of exploration for oil and characterized by the presence of numerous oil companies' pipelines, wells and support infrastructure, the potential for intact undisturbed soil profiles with archaeological sensitivity within the Research MVA portion of the APE is limited, if not entirely absent (Karbula 2011).

As a result of the records and literature search, WSA recommended that the Research MVA portion of the APE has a low probability for containing NRHP-eligible historic properties and that no archeological survey of the Research MVA areas is needed for the Proposed Action (Karbula 2011). The Texas State Historic Preservation Officer (SHPO) concurred that the Research MVA area has a very low probability for containing NRHP-eligible properties and/or for formal designation as an SAL, and indicated that the Research MVA portion of the Proposed Action may proceed without consultation with the Texas SHPO, provided that no significant archaeological deposits are encountered during development activities within the Research MVA area (Wolfe 2011).

DOE has confirmed that no NRHP-listed historic properties or districts, neighborhood surveys, historical markers, cemeteries, museums, historic county courthouses, military sites, or state archaeological landmarks (buildings only) are within the APE or a 0.5 mile radius around the APE in Brazoria County, Texas (NPS 2011a, 2011b; Texas Historical Commission 2011).

The DOE is also initiating Section 106 consultation with the Texas State Historic Preservation Officer to identify any issues or concerns regarding cultural resources and historic properties in the APE in Brazoria County, Texas, that may be affected by the proposed Project as part of the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800. Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), will be invited to participate in the Section 106 consultation process.

The DOE looks forward to receiving your comments or concerns regarding traditional cultural properties, sacred sites, or site of traditional religious or cultural importance in the APE that might be affected by the proposed Project and an indication as to whether you wish to participate in the Section 106 consultation for the proposed project. Please forward the results of your review and any requests for additional information to DOE's tribal liaison for the Project:

Jesse Garcia
NETL Tribal Liaison
Environmental Compliance Division
National Energy Technology Laboratory
3610 Collins Ferry Road
Mail Stop B07, Room 333
Morgantown, WV 26507
PH: 304-285-0256
Fax: 304-285-4403
Jesse.Garcia@NETL.doe.gov

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,

Jesse P. Garcia

For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Brazoria County, Texas

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References:

Karbula, James W., Ph.D. 2011. Letter dated October 25, 2011, from Dr. James W. Karbula, Regional Project Director, William Self Associates, Inc., Austin, Texas, to Patricia Mercado-Allinger, State Archaeologist, Archeology Division, Texas Historical Commission, Austin, Texas. Re: *Denbury Onshore, LLC, CO2 Sequestration Monitoring, Verification, and Accounting (MVA), Hastings Field, Brazoria County, Texas*.

National Park Service. 2011a. National Historic Landmarks Program, Lists of National Historic Landmarks: National Historic Landmarks Survey, Listing of National Historic Landmarks by State: Louisiana and Texas. http://www.nps.gov/history/nhl/designations/Lists/LA01.pdf and http://www.nps.gov/history/nhl/designations/Lists/TX01.pdf (web sites accessed March 7, 2011).

National Park Service. 2011b. National Register of Historic Places, NPS Focus: Calcasieu Parish, Louisiana and Brazoria County, Texas. http://nrhp.focus.nps.gov/natreghome.do (web site accessed March 7, 2011).

Texas Historical Commission. 2011. Texas Historic Sites Atlas. http://atlas.thc.state.tx.us/shell-map-address.htm (web site accessed March 7, 2011).

Wolfe, Mark. 2011. Letter dated November 1, 2011, from Mark Wolfe, State Historic Preservation Officer, Texas Historical Commission, Austin, Texas, to James Karbula, William Self Associates, Inc., Austin, Texas. Re: *Project Review under Section 106 of the National Historic Preservation act of 1966 and the Antiquities Code of Texas, Denbury Onshore, LLC, CO2 Sequestration Monitoring, Verification, and Accounting (MVA), Hastings Field, Brazoria County, Texas*.

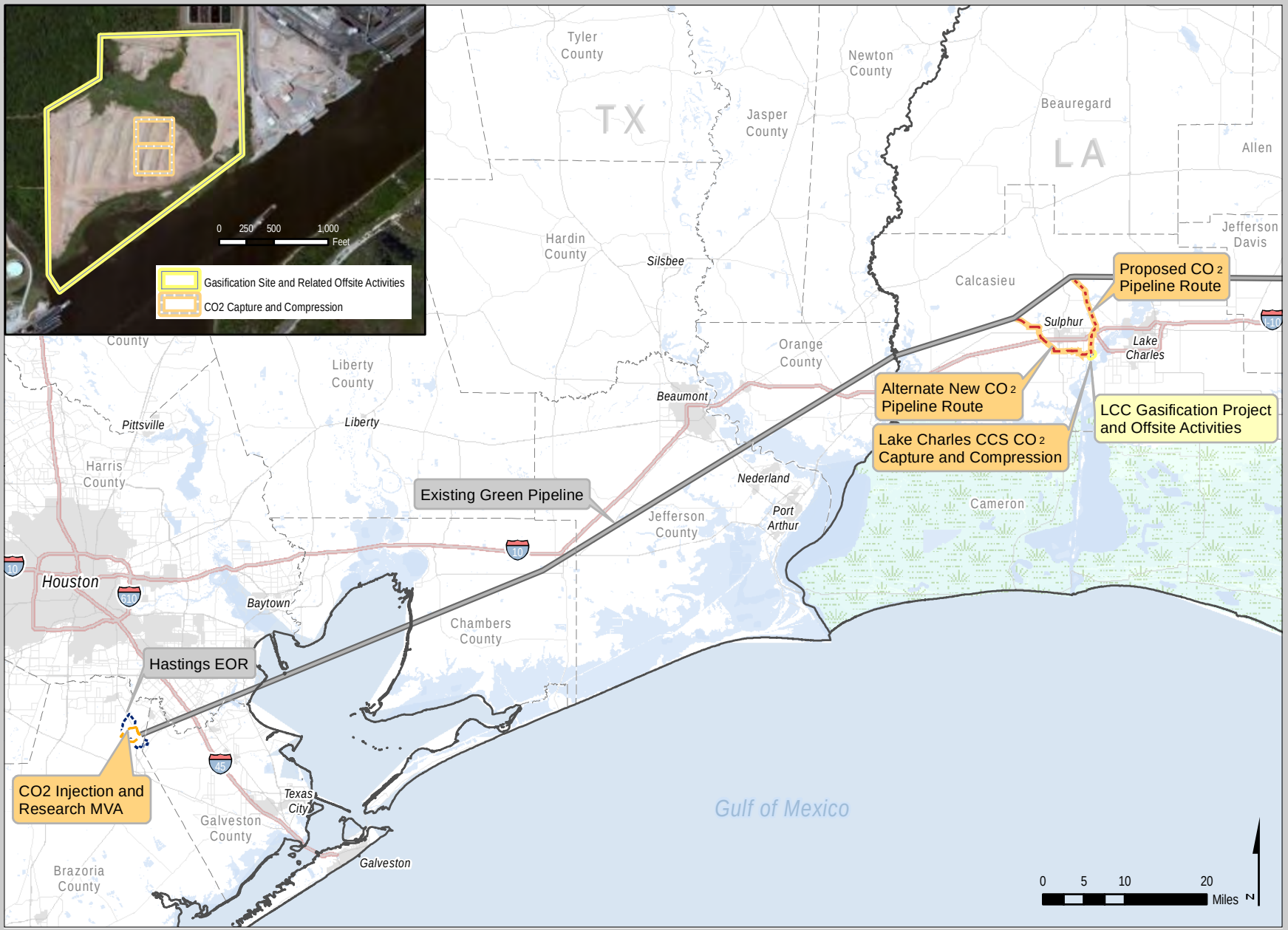
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Enclosure 1

Location of the Proposed
Lake Charles Carbon Capture and Sequestration Project

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Lake Charles CCS Project (Proposed Project)

- Alternative CO2 Pipeline Route
- Proposed CO2 Pipeline Route
- CO2 Capture and Compression
- CO2 injection and Research MVA

LCC Gasification Project (Connected Action)

- Gasification Site and Related Offsite Activities

Existing EOR Operations

- Green Pipeline
- Hastings EOR
- State Boundary
- County Boundary
- Major waterbody

Figure 2.2-1
Lake Charles CCS Project
Overall Location
Texas and Louisiana

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Enclosure 2

Area of Potential Effect
for Proposed Lake Charles Carbon Capture and Sequestration Project Facilities
in Brazoria County, Texas

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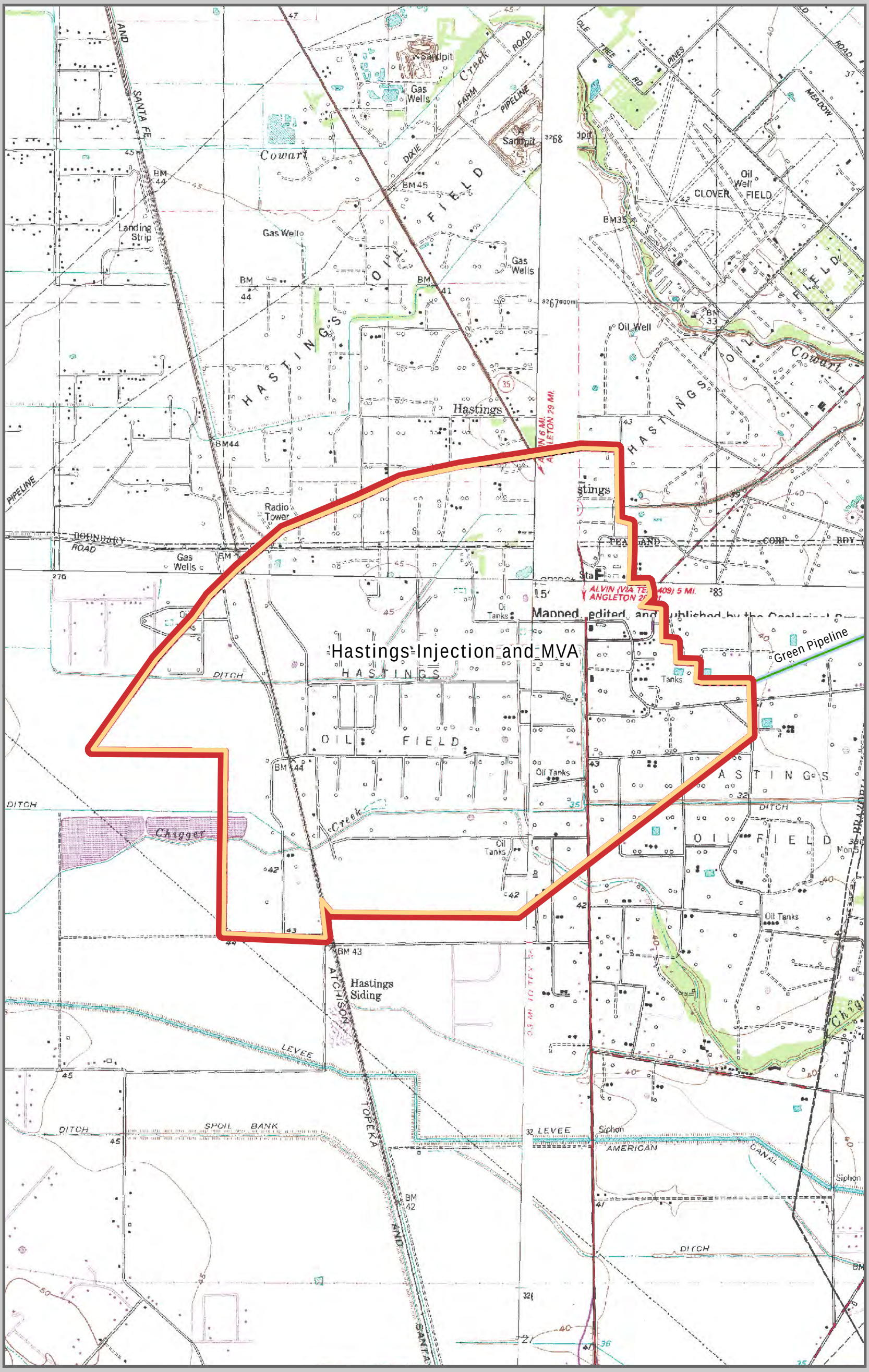


Figure 2
APE (Area of Potential Effect) for the Proposed AGR and Compression Site
Calcasieu Parish, Louisiana

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NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA

U.S. DEPARTMENT OF ENERGY

August 16, 2012

Frank K. Paiz
Governor
Ysleta Del Sur Pueblo of Texas
P.O. box 17579 – Ysleta Station
El Paso, TX 79917

SUBJECT: Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Brazoria County, Texas (and Calcasieu Parish, Louisiana)

Dear Governor Paiz:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Ysleta Del Sur Pueblo of Texas on the proposed project.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast and is not part of DOE's evaluation. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

626 Cochrans Mill Road, P.O. Box 10940, Pittsburgh, PA 15236
pierna.fayish@netl.doe.gov • Voice (412) 386-5428 • Fax (412) 386-4775 • www.netl.doe.gov

As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the facilities associated with the Lake Charles CCS Project and its associated CO_2 capture and compression facilities in Calcasieu Parish, Louisiana;
- the Lake Charles CCS Project proposed 11.1-mile long CO_2 pipeline in Calcasieu Parish;
- the Lake Charles CCS Project proposed Research MVA program for the CO_2 sequestration in an ongoing commercial enhanced oil recovery operation in Brazoria County, Texas; and,
- the LCCE Gasification Project and its associated facilities in Calcasieu Parish, Louisiana (a connected action).

DOE has determined that the area of potential effects (APE) for the undertaking in Texas will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project that are located in Brazoria County, Texas. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Texas includes the location of the proposed CO_2 sequestration in an ongoing commercial enhanced oil recovery operation and Research MVA program at the existing Hastings Oil Field in Brazoria County, Texas (see Enclosure 2).

In October 2011, William Self Associates, Inc. (WSA) conducted a records and literature search of the area within the Research MVA portion of the APE for the proposed action (Karbula 2011). The results of this records and literature search were sent to your office on October 25, 2011 and are included in Enclosure 3. The purpose of the records and literature search by WSA was to determine the presence of previously identified cultural resources and historic properties within the Research MVA portion of the APE; to determine the extent of previous and existing disturbance and development within the Research MVA portion of the APE; and to evaluate the potential sensitivity of the Research MVA portion of the APE for unidentified cultural resources or historic properties. Results of the records and literature search by WSA indicated that there are no recorded archaeological sites, cemeteries, NRHP properties, State Archaeological Landmarks (SAL) or markers within the Research MVA portion of the APE. Because the Hastings Oil Field is a highly disturbed landscape resulting from decades of exploration for oil and characterized by the presence of numerous oil companies' pipelines, wells and support infrastructure, the potential for intact undisturbed soil profiles with archaeological sensitivity within the Research MVA portion of the APE is limited, if not entirely absent (Karbula 2011).

As a result of the records and literature search, WSA recommended that the Research MVA portion of the APE has a low probability for containing NRHP-eligible historic properties and that no archeological survey of the Research MVA areas is needed for the Proposed Action (Karbula 2011). The Texas State Historic Preservation Officer (SHPO) concurred that the Research MVA area has a very low probability for containing NRHP-eligible properties and/or for formal designation as an SAL, and indicated that the Research MVA portion of the Proposed Action may proceed without consultation with the Texas SHPO, provided that no significant archaeological deposits are encountered during development activities within the Research MVA area (Wolfe 2011).

DOE has confirmed that no NRHP-listed historic properties or districts, neighborhood surveys, historical markers, cemeteries, museums, historic county courthouses, military sites, or state archaeological landmarks (buildings only) are within the APE or a 0.5 mile radius around the APE in Brazoria County, Texas (NPS 2011a, 2011b; Texas Historical Commission 2011).

The DOE is also initiating Section 106 consultation with the Texas State Historic Preservation Officer to identify any issues or concerns regarding cultural resources and historic properties in the APE in Brazoria County, Texas, that may be affected by the proposed Project as part of the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800. Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), will be invited to participate in the Section 106 consultation process.

The DOE looks forward to receiving your comments or concerns regarding traditional cultural properties, sacred sites, or site of traditional religious or cultural importance in the APE that might be affected by the proposed Project and an indication as to whether you wish to participate in the Section 106 consultation for the proposed project. Please forward the results of your review and any requests for additional information to DOE's tribal liaison for the Project:

Jesse Garcia
NETL Tribal Liaison
Environmental Compliance Division
National Energy Technology Laboratory
3610 Collins Ferry Road
Mail Stop B07, Room 333
Morgantown, WV 26507
PH: 304-285-0256
Fax: 304-285-4403
Jesse.Garcia@NETL.doe.gov

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,

Jesse P. Garcia

For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Brazoria County, Texas

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References:

Karbula, James W., Ph.D. 2011. Letter dated October 25, 2011, from Dr. James W. Karbula, Regional Project Director, William Self Associates, Inc., Austin, Texas, to Patricia Mercado-Allinger, State Archaeologist, Archeology Division, Texas Historical Commission, Austin, Texas. Re: *Denbury Onshore, LLC, CO2 Sequestration Monitoring, Verification, and Accounting (MVA), Hastings Field, Brazoria County, Texas*.

National Park Service. 2011a. National Historic Landmarks Program, Lists of National Historic Landmarks: National Historic Landmarks Survey, Listing of National Historic Landmarks by State: Louisiana and Texas. http://www.nps.gov/history/nhl/designations/Lists/LA01.pdf and http://www.nps.gov/history/nhl/designations/Lists/TX01.pdf (web sites accessed March 7, 2011).

National Park Service. 2011b. National Register of Historic Places, NPS Focus: Calcasieu Parish, Louisiana and Brazoria County, Texas. http://nrhp.focus.nps.gov/natreghome.do (web site accessed March 7, 2011).

Texas Historical Commission. 2011. Texas Historic Sites Atlas. http://atlas.thc.state.tx.us/shell-map-address.htm (web site accessed March 7, 2011).

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Same as Enclosures 1 and 2 per

August 16, 2012 Correspondence to the Kikapoo Traditional Tribe of Texas

Regarding Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Brazoria County, Texas (and Calcasieu Parish, Louisiana)

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NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA

U.S. DEPARTMENT OF ENERGY

August 17, 2012

Donna Richard
President
Calcasieu Historical Preservation Society
P.O. Box 1214
Lake Charles, LA 70602

SUBJECT: Initiation of Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Ms. Richard:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed Project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Calcasieu Historical Preservation Society on the proposed Project.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

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As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the facilities associated with the Lake Charles CCS portion of the proposed Project in Calcasieu Parish, Louisiana;
- the facilities associated with the LCC Gasification portion of the proposed Project in Calcasieu Parish, Louisiana;
- the portion of the existing Green Pipeline that connects the facilities in Calcasieu Parish with the facilities in Brazoria County, Texas and traverses portions of Calcasieu Parish Louisiana, and Orange, Jefferson, Chambers, Harris, Galveston and Brazoria County, Texas; and,
- the facilities associated with the Lake Charles CCS portion of the proposed Project in Brazoria County, Texas.

DOE has determined that the area of potential effects (APE) for the undertaking in Louisiana will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCC Gasification that are located in Calcasieu Parish, Louisiana. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Louisiana is in an industrial setting on the west side of the Calcasieu River, and is in the vicinity of numerous energy-related facilities. The APE includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area
- the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest (see Enclosure 2).

Cultural resources investigations have been conducted within portions of the APE in Louisiana, including: Phase I archaeological survey of the property that contains the locations of the Lake Charles CCS Project and LCCE Gasification project; Phase I cultural resources survey of the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline, including extra workspace and access roads; and Phase IA cultural resources investigations of offsite facilities associated with the LCCE Gasification project (raw water, hydrogen, potable water, methanol and sulfuric acid pipelines; an overhead transmission line; a construction laydown area; and construction parking area).
The reports documenting these cultural resources investigations have been submitted separately to the Louisiana SHPO for review and comment by the consultants on behalf of the Applicant. A table summarizing the cultural resources investigations is in Enclosure 3.

DOE has confirmed that no NRHP-listed historic properties or previously recorded standing structures or historic districts are located within the APE or a 0.5-mile radius around the APE in Calcasieu Parish.

The DOE is conducting Section 106 consultation with the Louisiana State Historic Preservation Officer and federally recognized Indian tribes to identify any issues or concerns regarding cultural resources and historic properties in the APE in Calcasieu Parish, Louisiana that may be affected by the proposed Project as part of the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800.

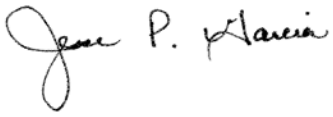
Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), are also invited to participate in the Section 106 consultation process. Therefore, the DOE is writing to seek your comments on any issues or concerns for cultural resources or historic properties in the APE that might be affected by the proposed project and would like to know whether you wish to participate in the Section 106 consultation process for the proposed project, per 36 CFR 800.3(f).

DOE looks forward to receiving your comments on any issues or concerns for cultural resources or historic properties that might be in the APE and affected by the proposed project or on any other parties that may have an interest in the Section 106 consultation for the proposed project. DOE also looks forward to receiving an indication as to whether you wish to participate in the Section 106 consultation for the proposed Project. Please forward the results of your review and any requests for additional information to our contractor:

Janine Whitken
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, New York 14086
(716) 684-8060 extension 2745
JWhitken@ene.com

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Calcasieu Parish, Louisiana
3. Summary Table for Cultural Resources Investigations Conducted within the APE in Louisiana

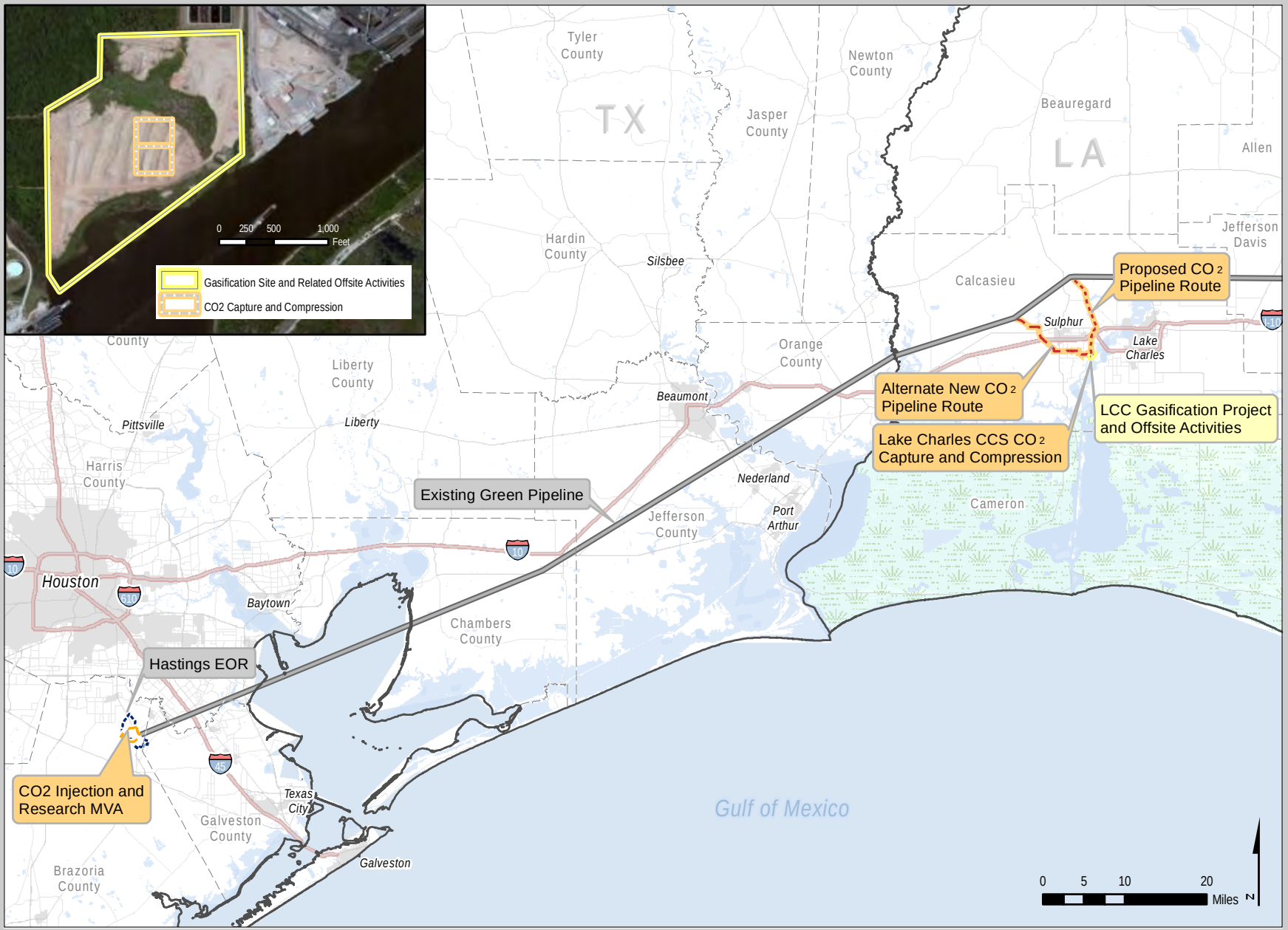
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Enclosure 1

Location of the Proposed
Lake Charles Carbon Capture and Sequestration Project

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Lake Charles CCS Project (Proposed Project)

- Alternative CO2 Pipeline Route
- Proposed CO2 Pipeline Route
- CO2 Capture and Compression
- CO2 injection and Research MVA

LCC Gasification Project (Connected Action)

- Gasification Site and Related Offsite Activities

Existing EOR Operations

- Green Pipeline
- Hastings EOR
- State Boundary
- County Boundary
- Major waterbody

Figure 2.2-1
Lake Charles CCS Project
Overall Location
Texas and Louisiana

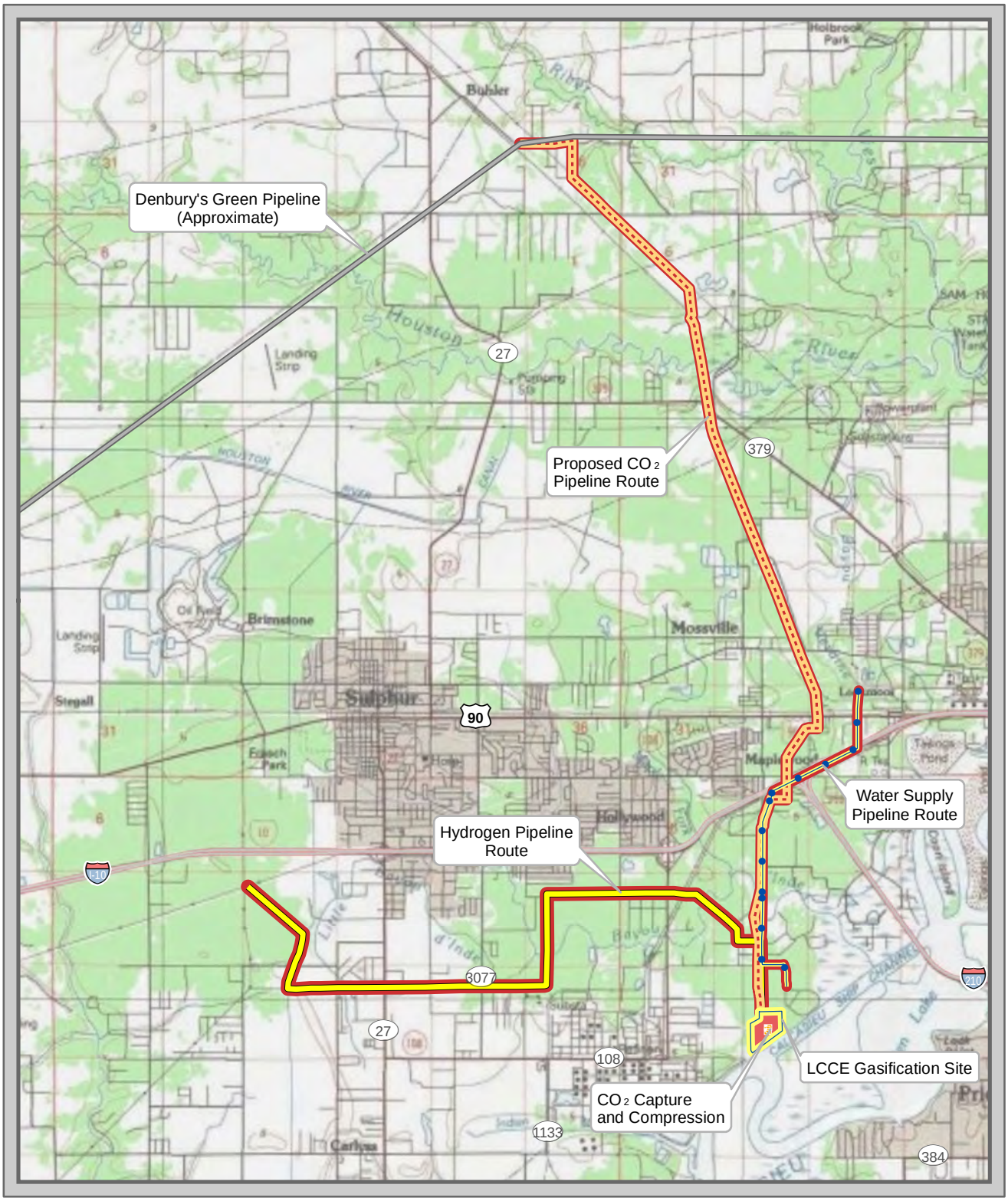
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Enclosure 2

Area of Potential Effect
for Proposed Lake Charles Carbon Capture and Sequestration Project Facilities
in Calcasieu Parish, Louisiana

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0 0.25 0.5 1 Miles

Area of Potential Effect (APE)

Lake Charles CCS Project (Proposed Action)

Alternative CO2 Pipeline Route

CO2 Capture and Compression

Proposed CO2 Pipeline Route

Existing Operations (Not in Project or Proposed Action)

Green Pipeline

LCCE Gasification Project (Connected Action)

Gasification Site and Related Offsite Activities

Water Supply Pipeline Route

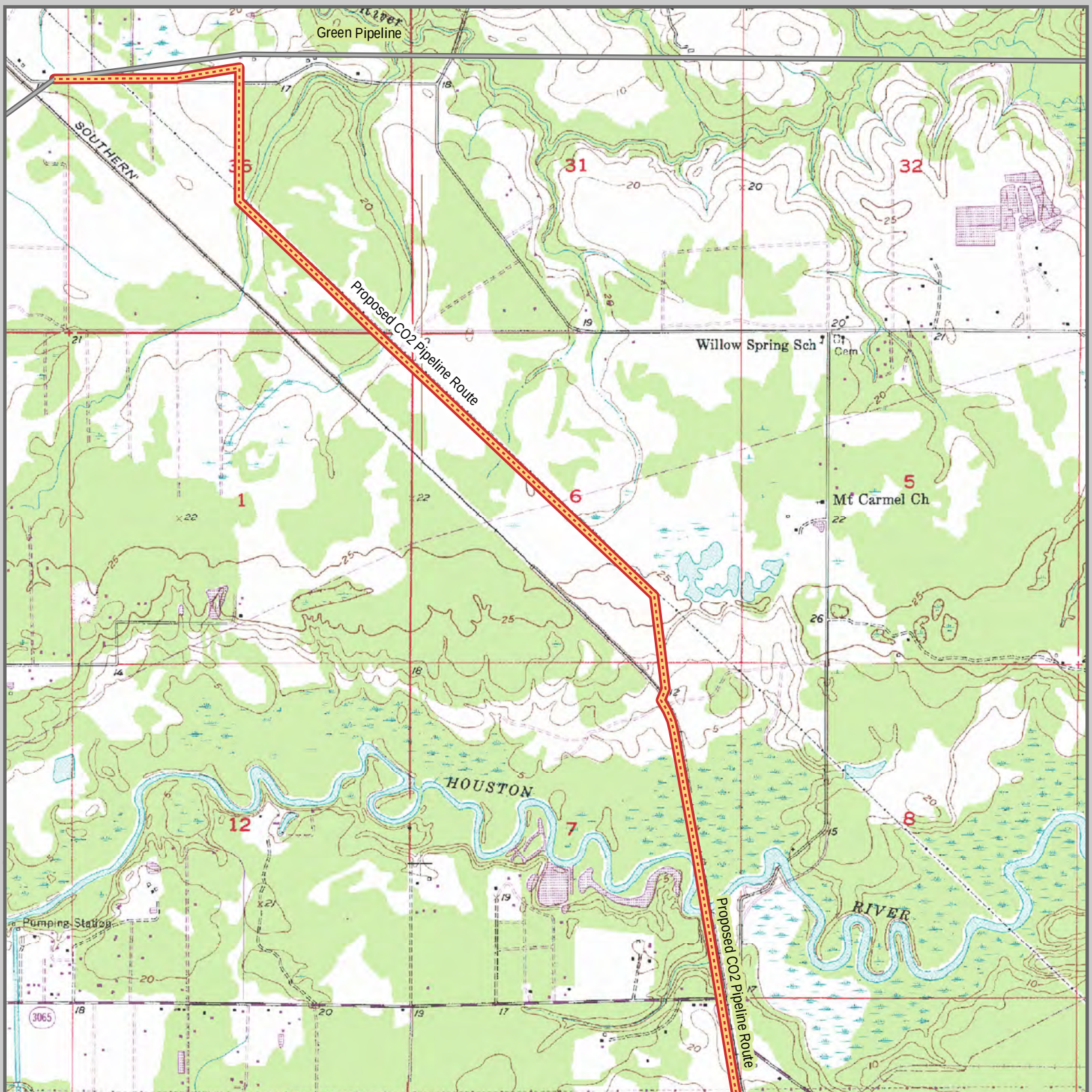
Hydrogen Pipeline Route

Figure 1
Overview of the APE (Area of Potential Effect) for the Proposed Facilities within Calcasieu Parish, Louisiana

Source: USGS 1:24,000 Friendswood (1998); Pearland (1983); Manval (1977); and Algoa (1977) Quadrangles.

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N

0 0.125 0.25 0.5 Miles

Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Area of Potential Effect (APE)

Existing Operations (Not in Project or Proposed Action)

Green Pipeline

Lake Charles CCS Project (Proposed Action)

CO2 Capture and Compression

Proposed CO2 Pipeline Route

Lake Charles Gasification Project (Connected Action)

Gasification Site

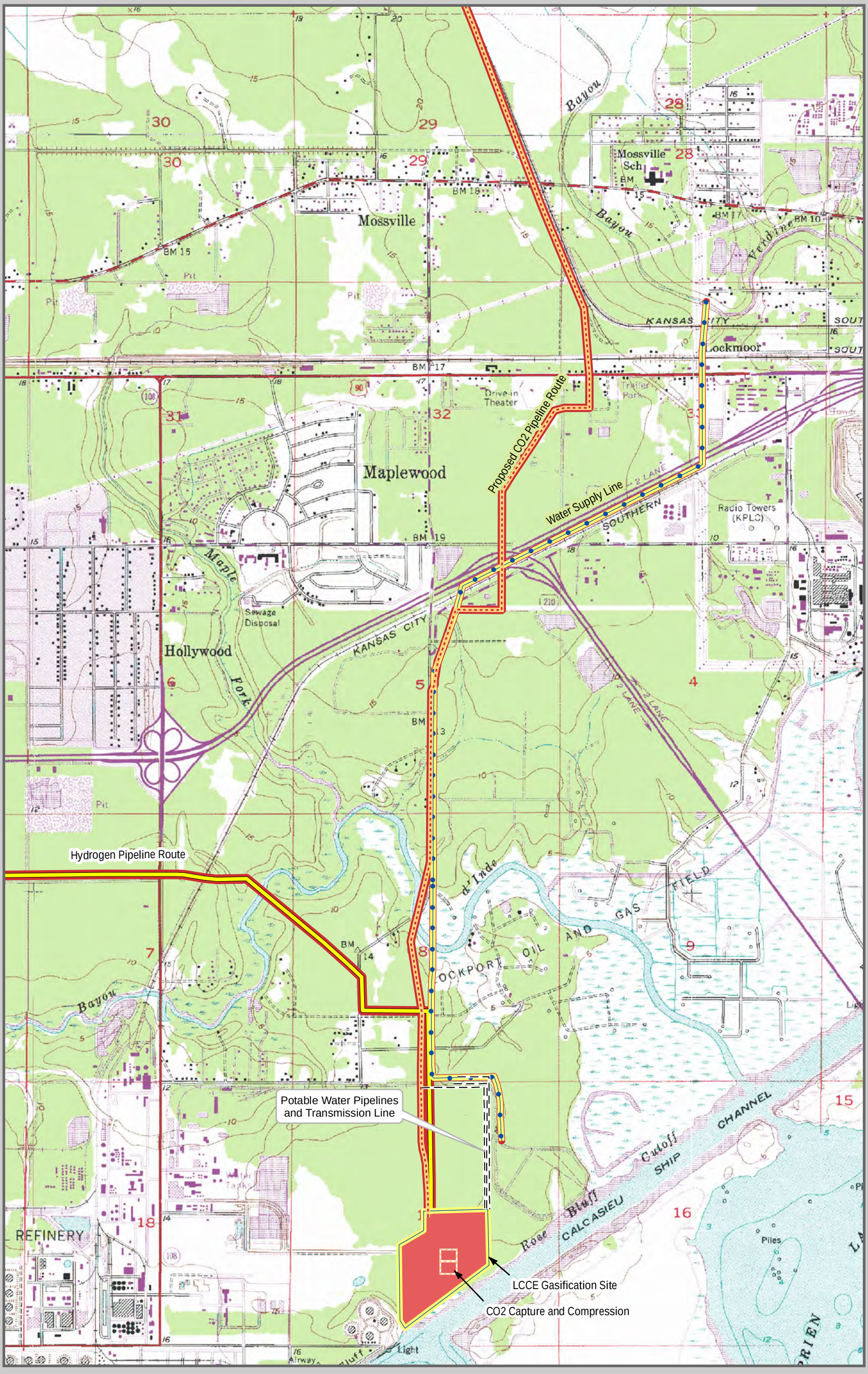
Water Supply Line

Hydrogen Pipeline Route

Figure 1-1
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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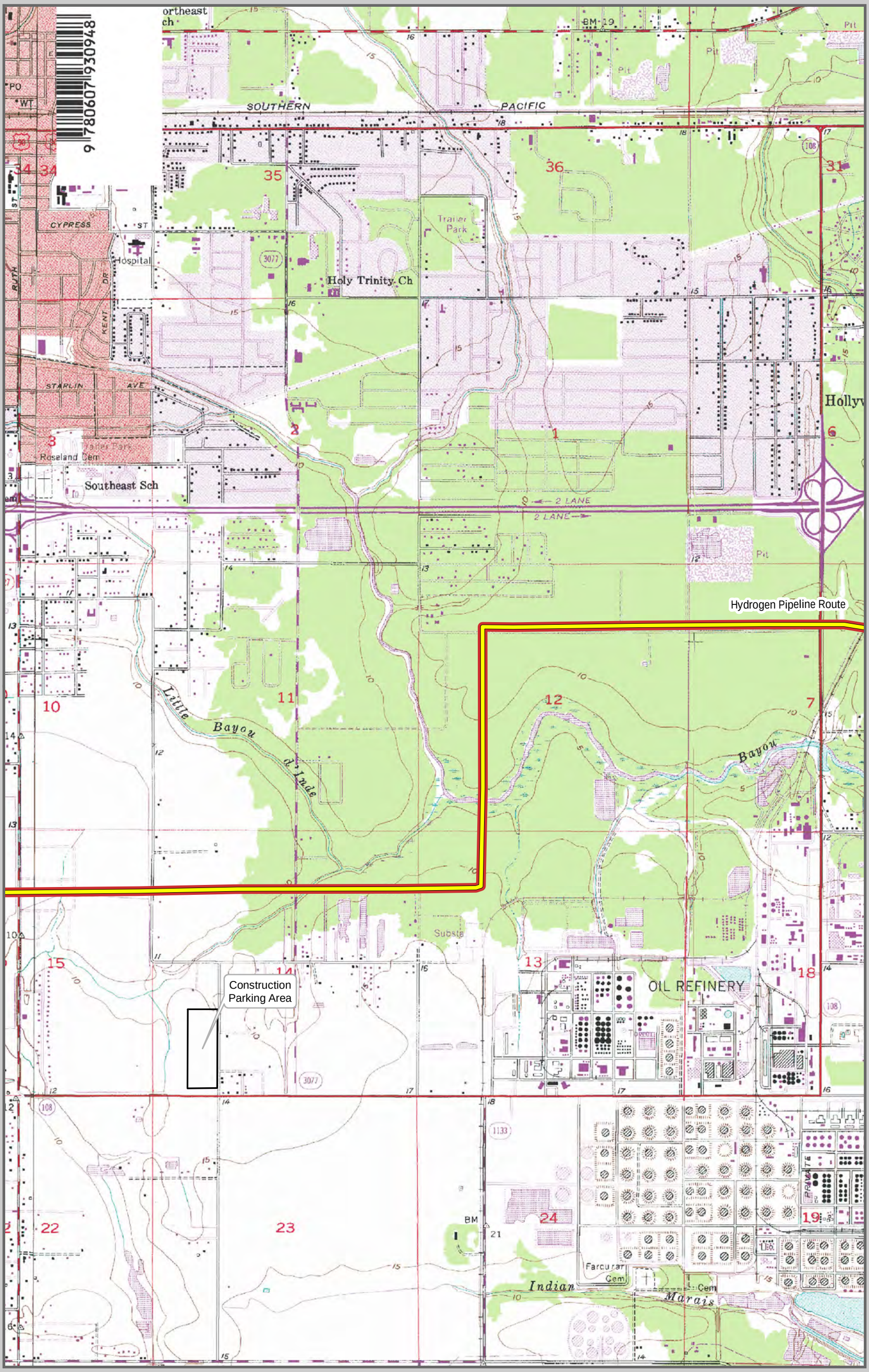


Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Figure 1-2
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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0 0.125 0.25 0.5 Miles

Source: USGS 1:24,000 Brimstone (1976); Buhler (1976); Sulphur (1977); and Westlakd (1977) Quadrangles.

Area of Potential Effect (APE)

Existing Operations (Not in Project or Proposed Action)

Green Pipeline

Lake Charles CCS Project (Proposed Action)

CO2 Capture and Compression

Proposed CO2 Pipeline Route

Lake Charles Gasification Project (Connected Action)

Gasification Site

Water Supply Line

Hydrogen Pipeline Route

Figure 1-3

APE (Area of Potential Effect) for the Proposed Facilities within

Calcasieu Parish, Louisiana

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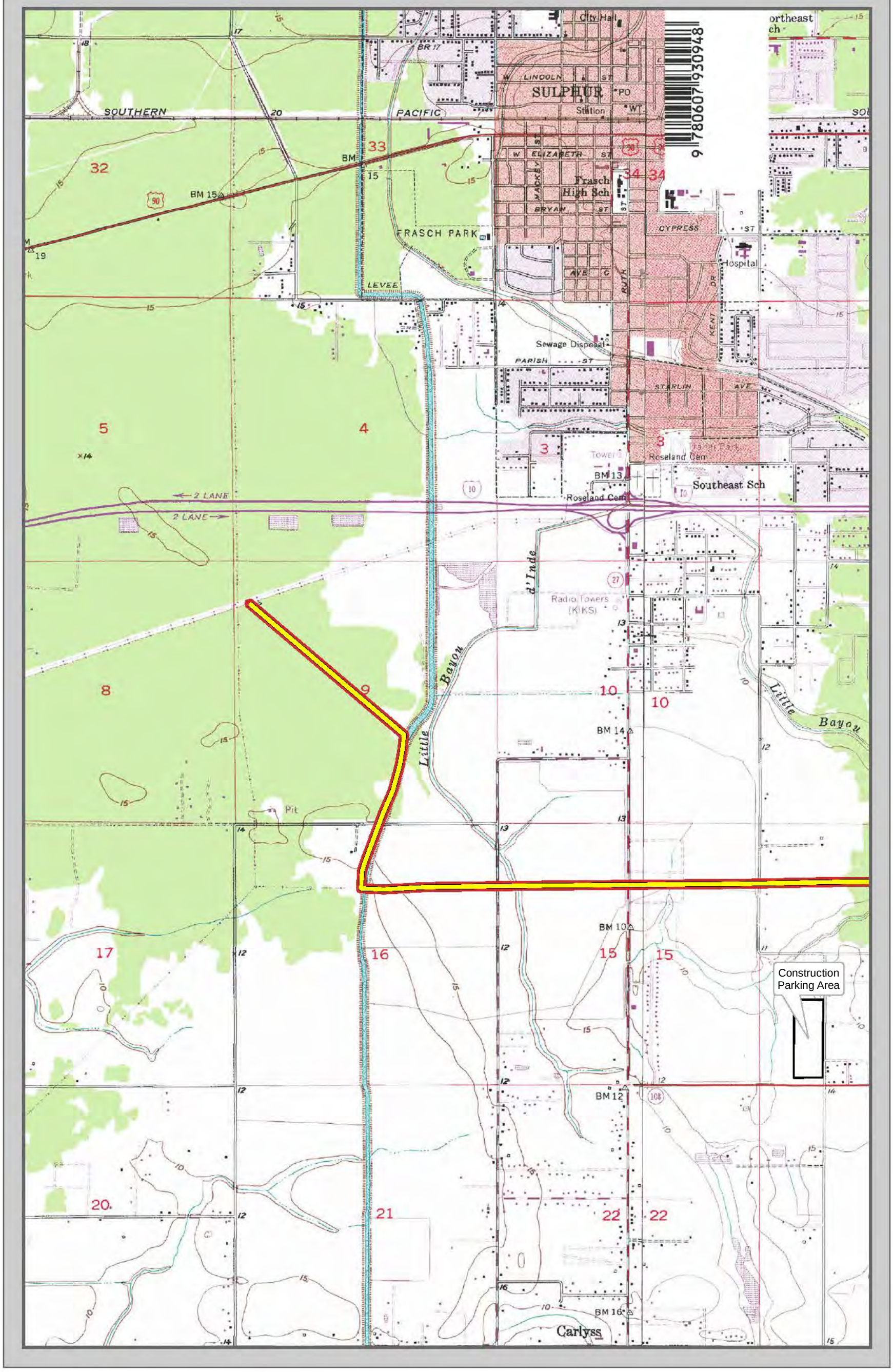


Figure 1-4
APE (Area of Potential Effect) for the Proposed Facilities within
Calcasieu Parish, Louisiana

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Enclosure 3

Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana

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Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
Lake Charles CCS Project (DOE proposes to fund)		
Carbon Capture and Compression (Calcasieu Parish, Louisiana)	• 2 acid gas removal units to capture CO_2 that would otherwise be emitted to the atmosphere • Produce CO_2 in the purity needed for sequestration or EOR • 2 CO_2 compressors pressurizing CO_2 to 2,250 psig for transport in a supercritical state • Monitoring and metering equipment • All equipment is completely contained within the LCC Gasification Project Site.	Phase I archaeological survey of known site within parcel previously conducted by URS in 2009; one cultural resources present (prehistoric archaeological site 16CU 29); site recommended not eligible for NRHP (letter report dated June 15, 2009 [Handley]). LA SHPO concurred with NRHP-eligibility recommendation; no further investigations of property required. (letter dated June 26, 2009 [Hutcheson]).
CO2 Pipeline (Calcasieu Parish, Louisiana)	• 11.1 mile pipeline from the CO_2 compressors to an existing CO_2 pipeline • Route includes a 50 foot permanent right of way (ROW) that would parallel existing ROWs (such as roadways, pipelines, railroads, transmission lines, and other linear features) throughout the length of the pipeline corridor to the extent practicable • CO_2 meter station at tie-in to existing CO2 pipeline (Green Pipeline)	Phase I cultural resources survey (for archaeological and architectural resources) by University of Alabama; two cultural resources identified (historic archaeological site 16CU73; and modern [late 20th century] Hardey Cemetery). Both resources recommended not eligible for NRHP; drilling pipeline beneath cemetery recommended for Hardey Cemetery (draft report dated November 18, 2011 [Watkins and Futato]). LA SHPO concurred with results of survey: no NRHP-eligible resources were identified within the APE; no historic properties will be impacted by the project; and no further work is necessary (letter dated April 25, 2012 [Breaux]).
LCCE Gasification Project (Connected Action, not under consideration for DOE funding)		

Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
Gasification Plant	• Provides CO_2 to the Lake Charles CCS Project • Petroleum coke gasification facility to produce methanol, hydrogen, and sulfuric acid on a 70 acre site in Calcasieu Parish • Site preparation of clearing, grading, raising the elevation currently being performed under USACE permit, including 26 acres of wetland mitigation implemented by the Port of Lake Charles • Construction expected to begin Fall 2012 and continue for 40 months	Phase I archaeological survey of known site within parcel previously conducted by URS in 2009; one cultural resources present (prehistoric archaeological site 16CU 29); site recommended not eligible for NRHP (letter report dated June 15, 2009 [Handley]). LA SHPO concurred with NRHP-eligibility recommendation and indicated no further investigations of property required (letter dated June 26, 2009 [Hutcheson]).
Offsite Activities	• 4 mile Raw Water Pipeline from Sabine River Canal. Route includes a 50 foot permanent ROW and 50 to 250 foot construction ROW that would parallel existing roadways, pipelines, railroads, transmission lines, and other linear features to the extent practicable. Leucadia would own and operate the raw water pipeline.	Phase IA cultural resources survey for archaeological and architectural resources) by URS; no cultural resources identified; further investigations of those areas that have not been previously disturbed or surveyed for cultural resources recommended (letter report dated May 16, 2012 [Handley]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• 8.5 mile Hydrogen Pipeline to transport hydrogen to Air Products in, Sulphur, Louisiana. Route includes a 50 foot permanent ROW and 75 foot construction ROW that would parallel existing roadways, pipelines, railroads, transmission lines, and other linear features to the extent practicable. The hydrogen pipeline would be owned and operated by Air Products.	Phase IA cultural resources survey (for archaeological and architectural resources) by URS; no cultural resources identified; further investigations of those areas that have not been previously disturbed or surveyed for cultural resources recommended (letter report dated May 16, 2012 [Handley]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.

Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
	• Offsite Construction Parking Area with shuttle buses to and from the Plant site. This site is partially cleared and graded.	Phase IA cultural resources survey (for archaeological and architectural resources) by URS; no previously recorded cultural resources identified within APE; further investigations of those areas that have not been previously disturbed or surveyed for cultural resources recommended (letter report dated May 16, 2012 [Handley]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Potable Water Pipeline to provide access to existing city water currently supplying the Port of Lake Charles. This work would take place within currently developed ROWs.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (letter report dated May 16, 2012 [Handley]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Natural Gas Pipeline to provide start up fuel. This work includes upgrade to an existing line and new line and would take place within currently developed ROWs.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Transmission Line to connect with the existing 230 kV transmission line. Route includes one alternative that would take place within currently developed ROWs on the east side of the Plant access road or on the west side of adjacent industrial property occupied by LA Pigment.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.

Summary Table for Cultural Resources Investigations
Conducted within the APE in Louisiana

Project Component	Description	Status of Cultural Resources Investigations/ SHPO consultation
	• Methanol and Sulfuric Acid Pipelines to Storage. These pipelines would transport products to the LCC Gasification Project offsite storage area. This work would take place within currently developed ROWs.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Construction Laydown Area for staging of construction equipment. This site would be located near LCC Gasification Project on property to be leased from the Port of Lake Charles. The site would be prepared for storage of construction equipment prior to use by Leucadia.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.
	• Methanol and Sulfuric Acid Storage Area and Pipelines to Port of Lake Charles. The area will contain above ground storage tanks for methanol and sulfuric acid. The pipelines move product from the storage area to offload by barge, ship, truck, and rail on the Port of Lake Charles property. The storage area and pipelines will be on property owned by the Port of Lake Charles.	Included in 1-mile study area for Phase IA cultural resources desktop assessment (for archaeological and architectural resources) by URS of a methanol and sulfuric acid storage facility; no previously recorded cultural resources or historic properties identified (report dated July 2012 [URS]). Letter report was submitted to the LA SHPO on August 15, 2012, and LA SHPO review and comment is pending.

NATIONAL ENERGY TECHNOLOGY LABORATORY
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U.S. DEPARTMENT OF ENERGY

August 17, 2012

Mr. Bryan C. Beam
Parish Administrator
Office of the Administrator
Calcasieu Parish Police Jury
Parish Government Building
1015 Pithon Street
P.O. Box 1583
Lake Charles, LA 70602

SUBJECT: Initiation of Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Mr. Beam:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed Project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with Calcasieu Parish on the proposed Project.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

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pierna.fayish@netl.doe.gov • Voice (412) 386-5428 • Fax (412) 386-4775 • www.netl.doe.gov

As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the facilities associated with the Lake Charles CCS portion of the proposed Project in Calcasieu Parish, Louisiana;
- the facilities associated with the LCC Gasification portion of the proposed Project in Calcasieu Parish, Louisiana;
- the portion of the existing Green Pipeline that connects the facilities in Calcasieu Parish with the facilities in Brazoria County, Texas and traverses portions of Calcasieu Parish Louisiana, and Orange, Jefferson, Chambers, Harris, Galveston and Brazoria County, Texas; and,
- the facilities associated with the Lake Charles CCS portion of the proposed Project in Brazoria County, Texas.

DOE has determined that the area of potential effects (APE) for the undertaking in Louisiana will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCC Gasification that are located in Calcasieu Parish, Louisiana. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Louisiana is in an industrial setting on the west side of the Calcasieu River, and is in the vicinity of numerous energy-related facilities. The APE includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area
- the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest (see Enclosure 2).

Cultural resources investigations have been conducted within portions of the APE in Louisiana, including: Phase I archaeological survey of the property that contains the locations of the Lake Charles CCS Project and LCCE Gasification project; Phase I cultural resources survey of the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline, including extra workspace and access roads; and Phase IA cultural resources investigations of offsite facilities associated with the LCCE Gasification project (raw water, hydrogen, potable water, methanol and sulfuric acid pipelines; an overhead transmission line; a construction laydown area; and construction parking area). The reports documenting these cultural resources investigations have been submitted separately to the Louisiana SHPO for review and comment by the consultants on behalf of the Applicant. A table summarizing the cultural resources investigations is in Enclosure 3.

DOE has confirmed that no NRHP-listed historic properties or previously recorded standing structures or historic districts are located within the APE or a 0.5-mile radius around the APE in Calcasieu Parish.

The DOE is conducting Section 106 consultation with the Louisiana State Historic Preservation Officer and federally recognized Indian tribes to identify any issues or concerns regarding cultural resources and historic properties in the APE in Calcasieu Parish, Louisiana that may be affected by the proposed Project as part of the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800.

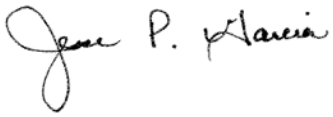
Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), are also invited to participate in the Section 106 consultation process. Therefore, the DOE is writing to seek your comments on any issues or concerns for cultural resources or historic properties in the APE that might be affected by the proposed project and would like to know whether you wish to participate in the Section 106 consultation process for the proposed project, per 36 CFR 800.3(f).

DOE looks forward to receiving your comments on any issues or concerns for cultural resources or historic properties that might be in the APE and affected by the proposed project or on any other parties that may have an interest in the Section 106 consultation for the proposed project. DOE also looks forward to receiving an indication as to whether you wish to participate in the Section 106 consultation for the proposed Project. Please forward the results of your review and any requests for additional information to our contractor:

Janine Whitken
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, New York 14086
(716) 684-8060 extension 2745
JWhitken@ene.com

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Calcasieu Parish, Louisiana
3. Summary Table for Cultural Resources Investigations Conducted within the APE in Louisiana

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Same as Enclosures 1 through 3 per

August 17, 2012 Correspondence to the Calcasieu Historical Preservation Society

Regarding Initiation of Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Calcasieu Parish, Louisiana (and Brazoria County, Texas)

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NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA

U.S. DEPARTMENT OF ENERGY

August 17, 2012

Susan H. Reed
Executive Director
Imperial Calcasieu Museum
204 W. Sallier Street
Lake Charles, LA 70601

SUBJECT: Initiation of Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Ms. Reed:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed Project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Imperial Calcasieu Museum on the proposed Project.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

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As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the facilities associated with the Lake Charles CCS portion of the proposed Project in Calcasieu Parish, Louisiana;
- the facilities associated with the LCC Gasification portion of the proposed Project in Calcasieu Parish, Louisiana;
- the portion of the existing Green Pipeline that connects the facilities in Calcasieu Parish with the facilities in Brazoria County, Texas and traverses portions of Calcasieu Parish Louisiana, and Orange, Jefferson, Chambers, Harris, Galveston and Brazoria County, Texas; and,
- the facilities associated with the Lake Charles CCS portion of the proposed Project in Brazoria County, Texas.

DOE has determined that the area of potential effects (APE) for the undertaking in Louisiana will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCC Gasification that are located in Calcasieu Parish, Louisiana. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Louisiana is in an industrial setting on the west side of the Calcasieu River, and is in the vicinity of numerous energy-related facilities. The APE includes the locations of:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area
- the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest (see Enclosure 2).

Cultural resources investigations have been conducted within portions of the APE in Louisiana, including: Phase I archaeological survey of the property that contains the locations of the Lake Charles CCS Project and LCCE Gasification project; Phase I cultural resources survey of the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline, including extra workspace and access roads; and Phase IA cultural resources investigations of offsite facilities associated with the LCCE Gasification project (raw water, hydrogen, potable water, methanol and sulfuric acid pipelines; an overhead transmission line; a construction laydown area; and construction parking area). The reports documenting these cultural resources investigations have been submitted separately to the Louisiana SHPO for review and comment by the consultants on behalf of the Applicant. A table summarizing the cultural resources investigations is in Enclosure 3.

DOE has confirmed that no NRHP-listed historic properties or previously recorded standing structures or historic districts are located within the APE or a 0.5-mile radius around the APE in Calcasieu Parish.

The DOE is conducting Section 106 consultation with the Louisiana State Historic Preservation Officer and federally recognized Indian tribes to identify any issues or concerns regarding cultural resources and historic properties in the APE in Calcasieu Parish, Louisiana that may be affected by the proposed Project as part of the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800.

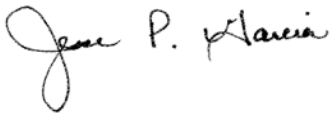
Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), are also invited to participate in the Section 106 consultation process. Therefore, the DOE is writing to seek your comments on any issues or concerns for cultural resources or historic properties in the APE that might be affected by the proposed project and would like to know whether you wish to participate in the Section 106 consultation process for the proposed project, per 36 CFR 800.3(f).

DOE looks forward to receiving your comments on any issues or concerns for cultural resources or historic properties that might be in the APE and affected by the proposed project or on any other parties that may have an interest in the Section 106 consultation for the proposed project. DOE also looks forward to receiving an indication as to whether you wish to participate in the Section 106 consultation for the proposed Project. Please forward the results of your review and any requests for additional information to our contractor:

Janine Whitken
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, New York 14086
(716) 684-8060 extension 2745
JWhitken@ene.com

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
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August 17, 2012 Correspondence to the Calcasieu Historical Preservation Society

Regarding Initiation of Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Calcasieu Parish, Louisiana (and Brazoria County, Texas)

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NATIONAL ENERGY TECHNOLOGY LABORATORY
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U.S. DEPARTMENT OF ENERGY

August 17, 2012

Debbie Johnson-Houston
Director
McNeese Library
Archives and Special Collections Department
McNeese State University
4205 Ryan Street
Lake Charles, LA

SUBJECT: Initiation of Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Calcasieu Parish, Louisiana (and Brazoria County, Texas)

Dear Ms. Johnson-Houston:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed Project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with Archives and Special Collections Department of McNeese State University on the proposed Project.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

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- the facilities associated with the LCC Gasification portion of the proposed Project in Calcasieu Parish, Louisiana;
- the portion of the existing Green Pipeline that connects the facilities in Calcasieu Parish with the facilities in Brazoria County, Texas and traverses portions of Calcasieu Parish Louisiana, and Orange, Jefferson, Chambers, Harris, Galveston and Brazoria County, Texas; and,
- the facilities associated with the Lake Charles CCS portion of the proposed Project in Brazoria County, Texas.

DOE has determined that the area of potential effects (APE) for the undertaking in Louisiana will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCC Gasification that are located in Calcasieu Parish, Louisiana. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The APE in Louisiana is in an industrial setting on the west side of the Calcasieu River, and is in the vicinity of numerous energy-related facilities. The APE includes the locations of:

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- the LCCE Gasification project, also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area
- the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest (see Enclosure 2).

Cultural resources investigations have been conducted within portions of the APE in Louisiana, including: Phase I archaeological survey of the property that contains the locations of the Lake Charles CCS Project and LCCE Gasification project; Phase I cultural resources survey of the proposed new 11.1-mile long CO_2 pipeline transporting CO2 to the existing Green Pipeline, including extra workspace and access roads; and Phase IA cultural resources investigations of offsite facilities associated with the LCCE Gasification project (raw water, hydrogen, potable water, methanol and sulfuric acid pipelines; an overhead transmission line; a construction laydown area; and construction parking area). The reports documenting these cultural resources investigations have been submitted separately to the Louisiana SHPO for review and comment by the consultants on behalf of the Applicant. A table summarizing the cultural resources investigations is in Enclosure 3.

DOE has confirmed that no NRHP-listed historic properties or previously recorded standing structures or historic districts are located within the APE or a 0.5-mile radius around the APE in Calcasieu Parish.

The DOE is conducting Section 106 consultation with the Louisiana State Historic Preservation Officer and federally recognized Indian tribes to identify any issues or concerns regarding cultural resources and historic properties in the APE in Calcasieu Parish, Louisiana that may be affected by the proposed Project as part of

the DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed Project and per 36 CFR Part 800.

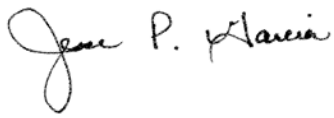
Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), are also invited to participate in the Section 106 consultation process. Therefore, the DOE is writing to seek your comments on any issues or concerns for cultural resources or historic properties in the APE that might be affected by the proposed project and would like to know whether you wish to participate in the Section 106 consultation process for the proposed project, per 36 CFR 800.3(f).

DOE looks forward to receiving your comments on any issues or concerns for cultural resources or historic properties that might be in the APE and affected by the proposed project or on any other parties that may have an interest in the Section 106 consultation for the proposed project. DOE also looks forward to receiving an indication as to whether you wish to participate in the Section 106 consultation for the proposed Project. Please forward the results of your review and any requests for additional information to our contractor:

Janine Whitken
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, New York 14086
(716) 684-8060 extension 2745
JWhitken@ene.com

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Calcasieu Parish, Louisiana
3. Summary Table for Cultural Resources Investigations Conducted within the APE in Louisiana

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Same as Enclosures 1 through 3 per

August 17, 2012 Correspondence to the Calcasieu Historical Preservation Society

Regarding Initiation of Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Calcasieu Parish, Louisiana (and Brazoria County, Texas)

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NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA

U.S. DEPARTMENT OF ENERGY

August 17, 2012

Gerald L. Roberts, PE
County Engineer
Brazoria County Engineering Department
451 N Valasco, Suite 230
Angleton, Texas 77515

SUBJECT: Initiation of Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Brazoria County, Texas (and Calcasieu Parish, Louisiana)

Dear Mr. Roberts:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed Project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with Brazoria County on the proposed Project.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

During the DOE demonstration phase of the proposed Project, approximately 4 million tons per year of CO_2 from two Acid Gas Removal (AGR) units would be captured and compressed in Calcasieu Parish, Louisiana at the LCC Gasification project, transported though a new pipeline connecting to Denbury Onshore, LLC's existing Green Pipeline. The existing Green Pipeline is designed to transport approximately 800 million standard cubic feet of CO_2 per day (about 17 million tons per year) and currently transports CO_2 from natural sources to existing EOR operations along the Gulf Coast. A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented on a portion of the existing CO_2 EOR operations at the Hastings oil field to confirm permanent storage of about one million tons per year during the demonstration period.

626 Cochrans Mill Road, P.O. Box 10940, Pittsburgh, PA 15236
pierna.fayish@netl.doe.gov • Voice (412) 386-5428 • Fax (412) 386-4775 • www.netl.doe.gov

As shown on Enclosure 1, these proposed and existing project-related facilities consist of:

- the facilities associated with the Lake Charles CCS portion of the proposed Project in Calcasieu Parish, Louisiana;
- the facilities associated with the LCC Gasification portion of the proposed Project in Calcasieu Parish, Louisiana;
- the portion of the existing Green Pipeline that connects the facilities in Calcasieu Parish with the facilities in Brazoria County, Texas and traverses portions of Calcasieu Parish Louisiana, and Orange, Jefferson, Chambers, Harris, Galveston and Brazoria County, Texas; and
- the facilities associated with the Lake Charles CCS portion of the proposed Project in Brazoria County, Texas.

DOE has determined that the area of potential effects (APE) for the undertaking in Texas will consist of the proposed new project-related facilities associated with the Lake Charles CCS Project and LCC Gasification that are located in Brazoria County, Texas. The APE for the undertaking does not include the portion of the Green Pipeline that connects the proposed new facilities in Calcasieu Parish, Louisiana and Brazoria County, Texas because it is an existing operating pipeline and no new project-related facilities are proposed along this portion of the pipeline.

The portion of the APE in Texas is in an industrial setting within the existing Hastings Oil Field, and is in the immediate vicinity of numerous energy-related facilities. The APE includes the location of the proposed Hasting injection site and MVA program at the existing Hastings Oil Field in Brazoria County, Texas (see Enclosure 2).

In October 2011, William Self Associates, Inc. (WSA) conducted a records and literature search of the area within the MVA portion of the APE for the proposed action. The purpose of the records and literature search by WSA was to determine the presence of previously identified cultural resources and historic properties within the MVA portion of the APE; to determine the extent of previous and existing disturbance and development within the MVA portion of the APE; and to evaluate the potential sensitivity of the MVA portion of the APE for unidentified cultural resources or historic properties. Results of the records and literature search by WSA indicated that there are no recorded archaeological sites, cemeteries, NRHP properties, State Archaeological Landmarks (SALs) or markers within the MVA portion of the APE. Because the Hastings Oil Field is a highly disturbed landscape resulting from decades of exploration for oil and characterized by the presence of numerous oil companies' pipelines, wells and support infrastructure, the potential for intact undisturbed soil profiles with archaeological sensitivity within the MVA portion of the APE is limited, if not entirely absent.

As a result of the records and literature search, WSA recommended that the MVA portion of the APE has a low probability for containing NRHP-eligible historic properties and that no archeological survey of the MVA areas is needed for the Proposed Action.

The Texas State Historic Preservation Officer (SHPO) concurred that the MVA area has a very low probability for containing NRHP-eligible properties and/or for formal designation as an SAL, and indicated that the MVA portion of the Proposed Action may proceed without consultation with the Texas SHPO, provided that no significant archaeological deposits are encountered during development activities within the MVA area.

DOE has confirmed that no NRHP-listed historic properties or districts, neighborhood surveys, historical markers, cemeteries, museums, historic county courthouses, military sites, or SALs that are buildings are within the APE or a 0.5 mile radius around the APE in Brazoria County, Texas.

DOE is also conducting Section 106 consultation with the Texas State Historic Preservation Officer and federally recognized to identify any issues or concerns and seek concurrence on the APE and on DOE's proposed finding of no historic properties affected, as part of DOE's fulfillment of responsibilities under Section 106 of the NHPA for the proposed project in accordance with 36 CFR Part 800.

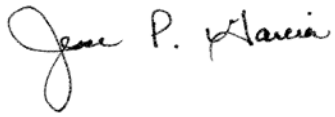
Additional consulting parties with interest and standing, as identified to in 36 CFR 800.2(c), are invited to participate in the Section 106 consultation process. Therefore, the DOE is writing to seek your comments on any issues or concerns for cultural resources or historic properties in the APE that might be affected by the proposed project and would like to know whether you wish to participate in the Section 106 consultation process for the proposed project, per 36 CFR 800.3(f).

DOE looks forward to receiving your comments on any issues or concerns for cultural resources or historic properties that might be in the APE and affected by the proposed project or on any other parties that may have an interest in the Section 106 consultation for the proposed project. DOE also looks forward to receiving an indication as to whether you wish to participate in the Section 106 consultation for the proposed Project.
Please forward the results of your review and any requests for additional information to our contractor:

Janine Whitken
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, New York 14086
(716) 684-8060 extension 2745
JWhitken@ene.com

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Brazoria County, Texas

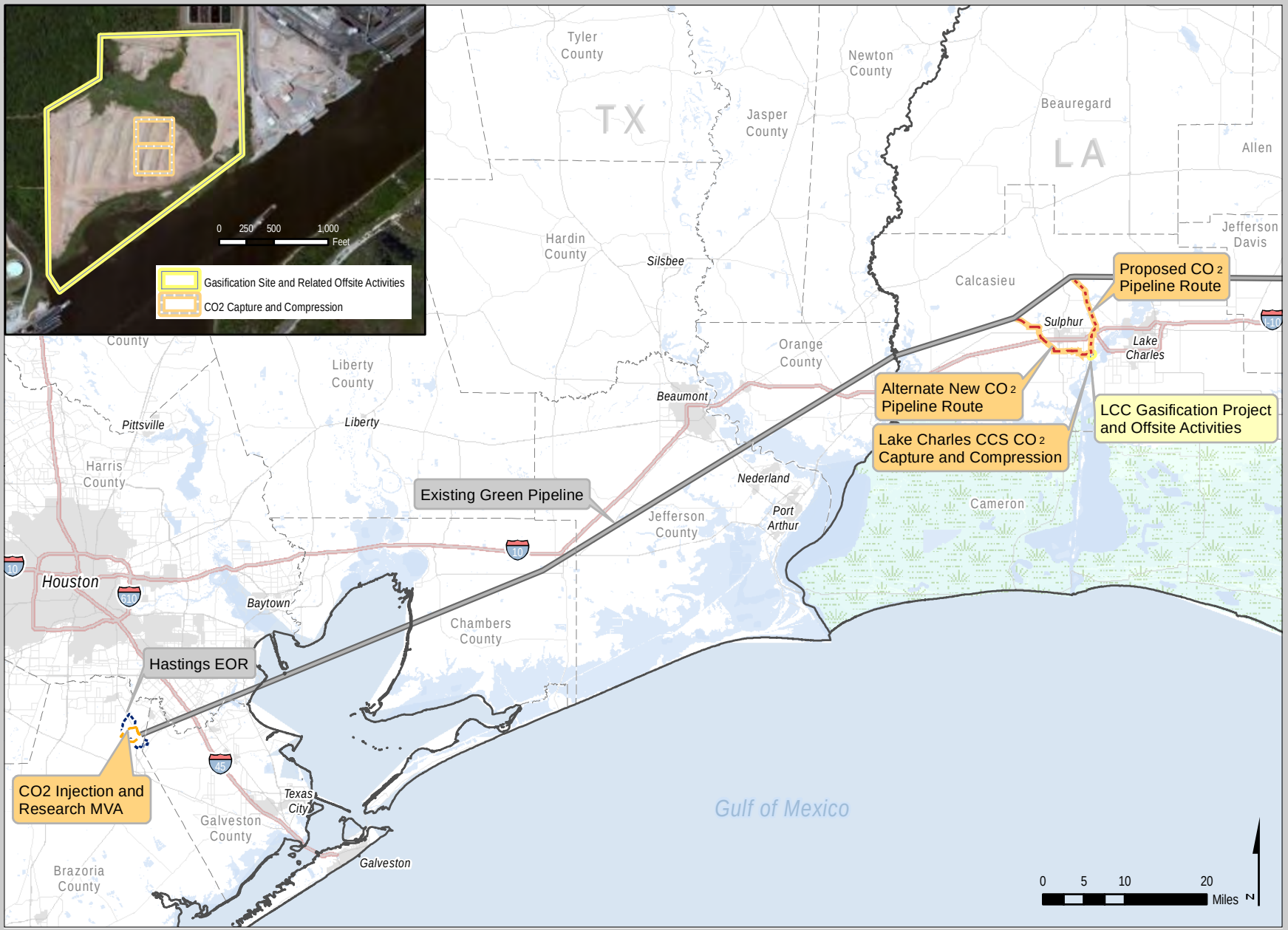
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Enclosure 1

Location of the Proposed
Lake Charles Carbon Capture and Sequestration Project

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Lake Charles CCS Project (Proposed Project)

- Alternative CO2 Pipeline Route
- Proposed CO2 Pipeline Route
- CO2 Capture and Compression
- CO2 injection and Research MVA

LCC Gasification Project (Connected Action)

- Gasification Site and Related Offsite Activities

Existing EOR Operations

- Green Pipeline
- Hastings EOR
- State Boundary
- County Boundary
- Major waterbody

Figure 2.2-1
Lake Charles CCS Project
Overall Location
Texas and Louisiana

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Enclosure 2

Area of Potential Effect
for Proposed Lake Charles Carbon Capture and Sequestration Project Facilities
in Brazoria County, Texas

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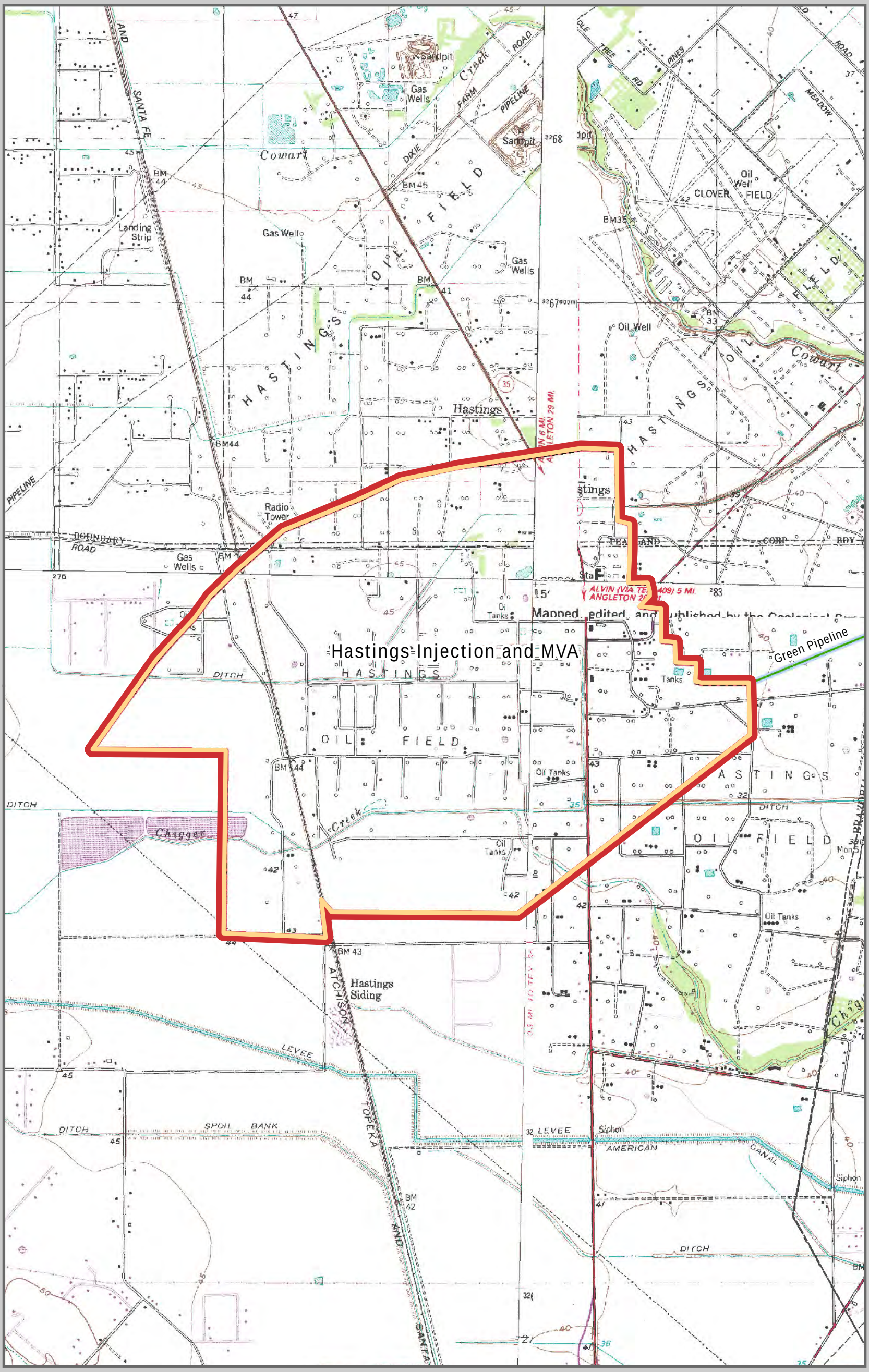


Figure 2
APE (Area of Potential Effect) for the Proposed AGR and Compression Site
Calcasieu Parish, Louisiana

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NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA

U.S. DEPARTMENT OF ENERGY

August 17, 2012

Sandra Pollan
Brazoria County Historical Commissioner
109 Lazy Lane
Lake Jackson, Texas 77566

SUBJECT: Initiation of Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Brazoria County, Texas (and Calcasieu Parish, Louisiana)

Dear Ms. Pollan:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed Project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Brazoria County Historical Commission on the proposed Project.

DOE's proposed action is to provide partial funding for the construction and operation of the proposed Lake Charles CCS Project, which was selected by the DOE for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Sequestration (ICCS) Program. The Lake Charles CCS Project would demonstrate: (1) advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification Project (the LCCE Gasification Project) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and (2) permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the Hastings oil field south of Houston, Texas.

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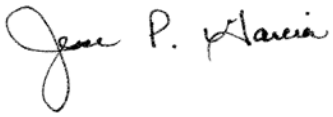
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Janine Whitken
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If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Brazoria County, Texas

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Same as Enclosures 1 and 2 per

August 17, 2012 Correspondence to the Brazoria County Engineering Department

Regarding Initiation of Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Brazoria County, Texas (and Calcasieu Parish, Louisiana)

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NATIONAL ENERGY TECHNOLOGY LABORATORY
Albany, OR • Morgantown, WV • Pittsburgh, PA

U.S. DEPARTMENT OF ENERGY

August 17, 2012

Jackie Haynes
Executive Director
Brazoria County Historical Museum
100 E Cedar Street
Angleton, TX 77515

SUBJECT: Initiation of Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project
Brazoria County, Texas (and Calcasieu Parish, Louisiana)

Dear Ms. Haynes:

The Department of Energy (DOE) proposes to provide financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration (CCS) (Project), proposed by Leucadia Energy, LLC (Leucadia) and located in Calcasieu Parish, Louisiana and Brazoria County, Texas (see Enclosure 1). DOE is preparing an Environmental Impact Statement (EIS) for the proposed Project as part of compliance with the National Environmental Policy Act of 1969, as amended (NEPA) and the DOE's regulations for implementing NEPA at 10 CFR 1021. This undertaking and its effects are also being considered under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulations at 36 CFR Part 800. As part of compliance with Section 106 of the NHPA, DOE is consulting with the Brazoria County Historical Museum on the proposed Project.

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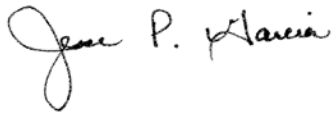
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Please forward the results of your review and any requests for additional information to our contractor:

Janine Whitken
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, New York 14086
(716) 684-8060 extension 2745
JWhitken@ene.com

If you have any questions or comments, please do not hesitate to contact Pierina Fayish, at 412-386-5428 or by email at pierina.fayish@netl.doe.gov.

Sincerely,



For Pierina N. Fayish
NEPA Document Manager

Enclosures:
1. Location of the proposed Lake Charles CCS Project
2. APE for proposed Lake Charles CCS Project facilities in Brazoria County, Texas

This page left blank intentionally.

Same as Enclosures 1 and 2 per

August 17, 2012 Correspondence to the Brazoria County Engineering Department

Regarding Initiation of Section 106 Consultation for Proposed Financial Assistance for the Lake Charles Carbon Capture and Sequestration (CCS) Project

Brazoria County, Texas (and Calcasieu Parish, Louisiana)

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From: Jesse Garcia
To: jjacobs@choctawnation.com
Cc: Pierina Fayish
Subject: Lake Charles Carbon Capture and Sequestration Project, Calcasieu Parish, LA

Dear Ms. Jacobs,

Thank you for your concurrence with the finding of no historic properties affected by this federal action.

Your objection to the delay between surveys is understood; however, prior to 2009, the Department of Energy (DOE) was not involved in any way with this property. The property owner performed the surveys and consultations years prior to DOE receiving and selecting Leucadia's proposal to lease and build on the site. The permits to fill and grade the area that includes 16CU29 were issued to the property owner, after it was determined that the site had been irreparably damaged by the surges of multiple hurricanes.

You asked about the potential for ground disturbance activity in the area of mound site 16CU29. As provided in our previous letter, the Louisiana SHPO concurred in 2009 that the mound site 16CU29 was not NRHP-eligible and that no further investigations or monitoring were necessary. The site was subsequently filled in accordance with the permits issued to the property owner. To date, four feet of fill, or 350,000 cubic yards, have been added to the site and another 8 feet, or 950,000 cubic yards will be added prior to construction of the gasifier. The damaged mound site has already been covered by four feet of fill and eventually will be covered by 12 feet of fill. It is therefore extremely unlikely that any portion of the mound site, or any other cultural materials, will be uncovered in future construction activity on the site. Consequently, DOE does not believe it is necessary or appropriate to require an archaeologist to be present during the construction of the LCCE gasification project.

Nonetheless, DOE has conferred with LCCE and they have agreed to work with their contractors to include a provision in their construction plan(s) to immediately notify LCCE if identifiable tribal artifacts or remains are found. If any such artifacts or remains are discovered in the course of construction of the gasification project, LCCE will notify the Louisiana SHPO and work cooperatively with the SHPO to ensure the artifacts or remains are handled appropriately.

Sincerely,

Jesse

Jesse Garcia
NETL Tribal Liaison
Environmental Compliance Division
National Energy Technology Laboratory
3610 Collins Ferry Road
Mail Stop 26, Room 107
Morgantown, WV 26507
PH: 304-285-0256
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Jesse.Garcia@NETL.doe.gov
>>> "Johnnie L. Jacobs" <jjacobs@choctawnation.com> 1:29 PM 7/12/2013 >>>

Dear Mr. Garcia,

Thank you for the clarification. It would be our hope that any federal agency would not wait 8 years to do further testing on an archaeological site as a mound site like 16CU29 once it has been identified to need further tested for national register eligibility. Even though the most recent archaeological field assessment states that there the site lacks depositional integrity and that no additional assessment is warranted, the Choctaw Nation of Oklahoma would like to request that an archaeologist that meets DOI standards be present to monitor any ground disturbance activity that may take place in the future in the area of 16CU29 and that a

copy of the monitoring report be sent to us. We concur with the finding of no historic properties effected at this time and that the project should move ahead as planned. However, as the project is located in an area that is of general historic interest to the Tribe, we request that work be stopped and our office contacted immediately if any Native American cultural materials are encountered. This stipulation should be placed on the construction plans to insure contractors are aware of it. Please feel free to contact me with any further questions or concerns.

Thank you,

Ms. Johnnie Jacobs

NHPA Section 106 Coordinator
Choctaw Nation of Oklahoma
Historic Preservation Department
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jjacobs@choctawnation.com

APPENDIX E

FLOODPLAIN AND WETLAND ASSESSMENT

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1 Introduction

In accordance with the regulations contained in Title 10 Code of Federal Regulations (CFR) Part 1022, Compliance with Floodplain/Wetlands Environmental Review Requirements, the U.S. Department of Energy (DOE) has established policy and procedures to consider impacts on floodplains and wetlands as part of its decision-making process. This policy was developed in response to Executive Order 11990— Protection of Wetlands (May 24, 1977), and Executive Order 11988—Floodplain Management (May 24, 1977). These executive orders require federal agencies to evaluate and, to the extent possible, minimize the impacts of their projects on floodplains and wetlands.

Concurrent with DOE's preparation of the EIS for the proposed Lake Charles Carbon Capture and Sequestration (Lake Charles CCS) project; DOE assessed the applicability of the floodplain management and wetland protection requirements in 10 CFR 1022 for the proposed action. DOE determined that construction of the Lake Charles CCS project would result in impacts to wetlands and 100-year floodplains. DOE developed this floodplain and wetland assessment to describe the floodplains and wetlands that would potentially occur, evaluate the significance of potential floodplain and wetland impacts, and discuss potential alternatives and mitigation measures that could be implemented to avoid or minimize impacts of the proposed action on flood plains and wetlands to the maximum extent practicable.

2 Project Description

2.1 DOE's Proposed Action

DOE's proposed action is to provide financial assistance to Leucadia for implementation of their proposed Lake Charles CCS project. The project would demonstrate: (1) advanced technologies to capture CO_2 and (2) permanent sequestration of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations. Specifically, financial assistance to implement the Lake Charles CCS project would facilitate the following:

- Capture and compression of CO_2 at the Lake Charles Clean Energy, LLC (LCCE) Gasification plant in Calcasieu Parish, Louisiana,
- Transport of CO_2 via a new 11.9-mile-long pipeline that will connect to the existing Green Pipeline, and
- A research MVA program aimed at providing an accurate accounting of approximately 1 million tons of stored CO_2 and a high level of confidence that the CO_2 will remain sequestered permanently in a portion of the Hastings oil field through existing EOR operations in Texas.

2.2 Applicant's Proposed Project

The Lake Charles CCS Project, as described above, involves the capture and sequestration of CO_2 from Leucadia's LCCE Gasification plant, a petroleum coke gasification plant to be constructed by LCCE in Calcasieu Parish, adjacent to the Lake Charles Harbor and Terminal District Bulk Handling Terminal near Carlyss, Louisiana. (As of June 1, 2012, the name of Lake Charles Cogeneration, LLC was changed to Lake Charles Clean Energy, LLC. Prior

references to Lake Charles Cogeneration (LCC) Gasification are now LCCE Gasification.) The LCCE Gasification plant would not be funded by DOE; however, the DEIS addressed it as a connected action (Federal Register 2011). Leucadia would implement the Lake Charles CCS project with Denbury Onshore, LLC ("Denbury"). Leucadia would capture and compress CO_2 for delivery to Denbury's affiliate pipeline, and Denbury would inject and monitor CO_2 as part of ongoing commercial EOR operations at the Hastings oil field. The LCCE Gasification plant would consist of:

- The gasification plant; and

- Offsite activities
  - Construction parking area
  - Equipment laydown and methanol/sulfuric acid storage
  - Linears for natural gas, potable water, transmission, sulfuric acid, and methanol
  - Water supply and hydrogen pipelines

In selecting the locations of LCCE Gasification plant and the Lake Charles CCS project sites, Leucadia applied siting criteria, including:

- Land ownership (public, private);
- Consistency with current land use;
- Proximity to the Port of Lake Charles for the gasification facility major components;
- Proximity to the gasification facility for offsite components;
- Parcel size;
- Use of existing utility corridors;
- Avoid wetland, streams and floodplains;
- Minimize the number of pipeline and linear stream crossings;
- Avoid sensitive habitats; and
- Avoid cultural resources.

2.3 Nature and Extent of the Flood Hazard

Executive Order 11988, *Flood Plain Management*, requires that development in floodplains be avoided if practicable. A floodplain is any land area susceptible to inundation by floodwaters from any source. A 100-year flood is a flood having a 1% chance of being equaled or exceeded in magnitude in any given year. The 100-year floodplain is the area adjoining a river, stream, or watercourse covered by water in the event of a 100-year flood. These floodplains are mapped by the Federal Emergency Management Agency (FEMA) for insurance rate purposes and emergency response planning. These floodplains are assigned zone designations. Zone A indicates an area with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage, and because detailed analyses are not performed for such area, no depths or base flood elevations are shown within these zones. Zone AE indicates the base floodplain where base flood elevations are provided. AE Zones are now used on new format Flood Insurance Rate Maps. Zone AO indicates river and stream flood hazard areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these

zones. Floodplain encroachment is any man-made obstruction or filling in of the floodplain that displaces the natural passage of floodwaters.

DOE utilized multiple information sources to identify areas where proposed project components would be located within FEMA mapped floodplains that would then represent potential areas of concern for floodplains. Additionally, in the project vicinity, wetlands comprise much of the floodplains in the Lake Charles area. Therefore, as part of flood hazard evaluation and wetland impact assessment, DOE utilized multiple information sources including field surveys conducted in 2007 by the Port of Lake Charles and a jurisdictional wetland determination conducted by the U.S. Army Corps of Engineers (USACE) New Orleans District as part of a 2008 USACE permit approval for LCCE Gasification plant site development to identify wetland areas of concern. DOE also used desktop surveys, Flood Insurance Rate Maps (FIRM's), U.S. Geological Survey topographic maps, and U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) data at the LCCE Gasification plant site and offsite activities locations, the Lake Charles CCS project site, pipeline corridors, and the West Hastings research MVA site at the Hastings oil field to identify floodplains and wetlands that would potentially be impacted by the proposed and connected actions.

DOE assessed impacts to wetlands and floodplains primarily by using GIS to calculate impact acreages for reported wetlands and mapped floodplains and also relied on flood hazard analysis undertaken in 2012 by the Calcasieu Parish Police Jury Engineering Department. Baseline environmental data (i.e., wetlands and floodplains locations) were overlaid with project features to determine the locations and areal extents of potential wetland and floodplain impacts. In locations where wetlands and floodplains would be impacted, qualitative assessments were made of what those impacts would be, based on the factors considered for assessing impacts described in Section 4.4.1 of the Lake Charles CCS Project EIS.

2.3.1 LCCE Gasification Project and Lake Charles CCS Project CO_2 Capture and Compression Facilities

Figure 2.3-1 shows the LCCE Gasification plant and the Lake Charles CCS CO_2 Capture and Compression Facilities site and related project components relative to the FEMA Flood Insurance Rate Map (effective June 1, 1983) and Rita Recovery Map (panel numbers LA-KK19 and LA-KK20). Sections of the connected 70-acre LCCE Gasification plant site are within 100- year or 500-year floodplains. Site development activities include the addition of fill material that would result in elevations above the local 100-year and 500-year base flood elevations. The Advisory Base Flood Elevation (ABFE) for the site is 10 feet above mean sea level (MSL). The natural topographic elevations ranged from 2 feet to 11 feet MSL. **The project site would be filled to 11 feet at the crown and sloped to drain west and east to engineered stormwater conveyance features.** The project site does not encroach on the regulatory floodway which is the Calcasieu River. Offsite activities associated with the LCCE Gasification plant including the proposed 5-acre off site construction parking area, 40-acre equipment laydown and methanol/sulfuric acid storage area, linears for natural gas, potable water, electric transmission, sulfuric acid and methanol pipelines are located within portions of the Bayou d'Inde and Calcasieu River floodplains. Approximately 107 acres would be involved in these various linears and pipelines.

CO_2 Pipeline Lateral

The proposed CO2 pipeline route is located in proximity to the floodplains of Bayou d'Inde, the Houston River, and the Calcasieu River, and much of the proposed CO_2 pipeline route is located within 100-year floodplains of the Calcasieu River and its tributaries (see Figure 2.3-1).

Therefore, the proposed CO_2 pipeline route would experience flooding conditions similar to those of the LCCE Gasification plant and Lake Charles CCS CO_2 Capture and Compression Facilities site.

2.3.2 Research MVA Site

FEMA conducted a floodplain survey in the vicinity of the Hastings oil field, which is located in Brazoria County, Texas, and developed Flood Insurance Rate Maps (FEMA 2010) for the area. Areas identified as Special Flood Hazard Areas are inundated by 100-year floods (Zones A, AE, and AO) which occur within short distances of Chigger Creek and Cowart Creek (see Figure 2.3-2). The southern approximately one-third of the Hastings oil field, including the two proposed well locations for the MVA, are located within the 100-year floodplain of Chigger Creek.

3 Potential Floodplain and Wetland Impacts

3.1 LCCE Gasification (Connected Action)

3.1.1 Construction

3.1.1.1 Gasification Plant

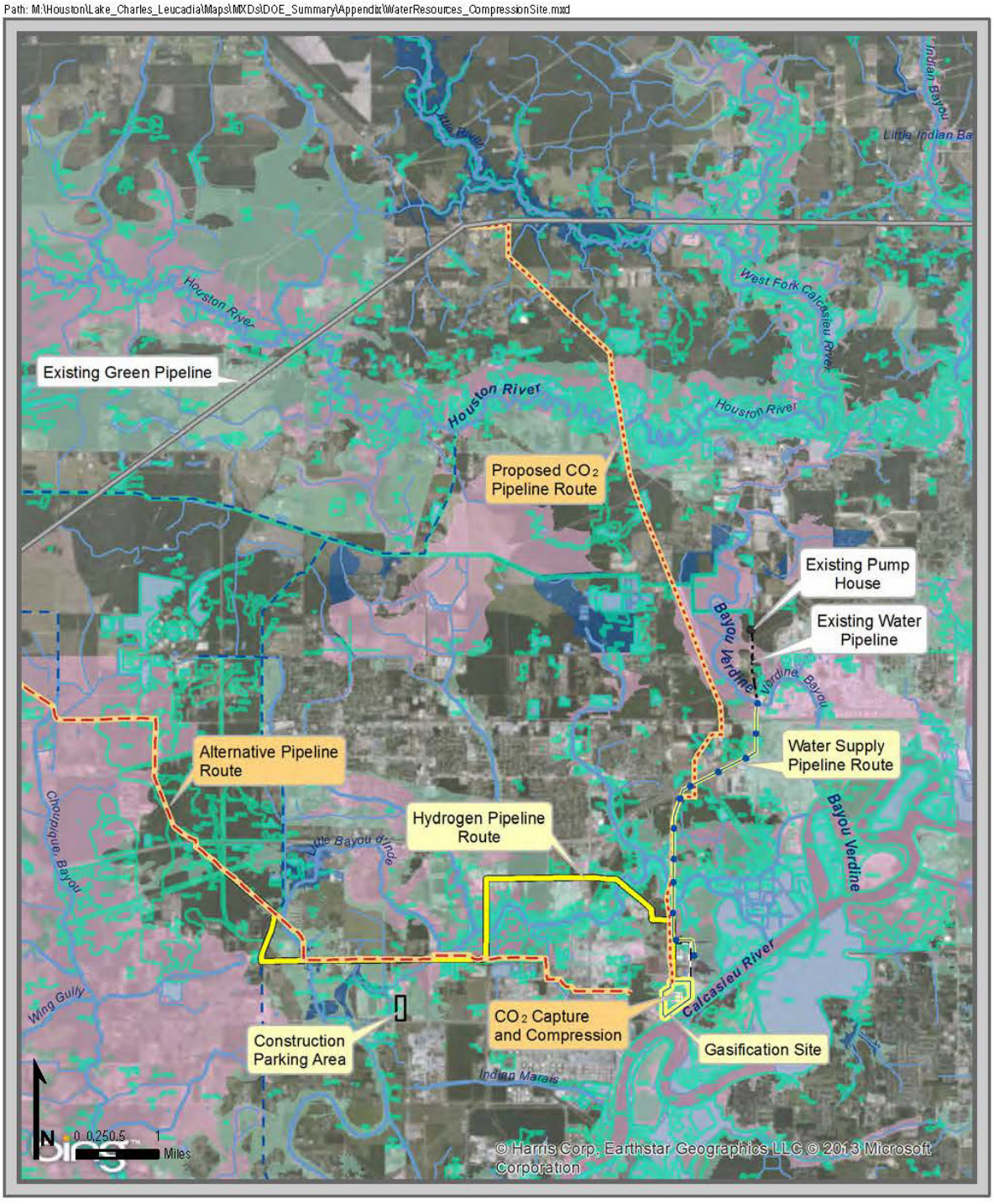
Floodplains

The LCCE Gasification plant site was within the 100- year floodplain. The USACE New Orleans District issued a permit to the Lake Charles Harbor and Terminal District to develop the LCCE Gasification plant site on October 18, 2008. Completed site development activities included the addition of fill material that resulted in elevations significantly above the local 100-year and 500-year base flood elevations.

Construction of the LCCE Gasification plant site has filled 70 acres of 100-year floodplain associated with Calcasieu River and Bayou d'Inde. **The fill elevated the site to 11 feet above mean sea level. It is surrounded by a confining sheetpile bulkhead.** In compliance with the Executive Order 11988 (Floodplain Management), the DOE evaluated whether funding the Lake Charles CCS, and therefore the connected action of the LCCE Gasification plant construction, conflicts with applicable local flood management plans or ordinances, or with FEMA's national standard for floodplain management.

The Project Engineer, the Levingston Group, LLC, conducted an engineering and hydrological analysis of the project. Based on their drainage study, Levingston Engineers, Inc. concluded that "current proposed systems (presume east and west drainage systems of widened and deepened ditches and culverts) were sized to accommodate the entire runoff from the 71-acre proposed Lake Charles Cogeneration facility." Levingston further stated that the "installation should provide no impact on upstream developments and only minor impacts on upstream water surface elevations." The Calcasieu Parish Police Jury Division of Engineering concurred with this

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Canal/Ditch
Stream/River
NWI Wetland (Scanned Vectors)
Flood Zone
A
B
AE

Lake Charles CCS Project (Proposed Project)
CO_2 Capture and Compression
Proposed CO_2 Pipeline Route
Alternative CO_2 Pipeline Route

LCCE Gasification Project (Connected Action)
Gasification Site
Utility Linears: Natural Gas, Potable Water, Methanol and Sulfuric Acid Pipelines and Transmission Line Routes
Water Supply Pipeline Route
Hydrogen Pipeline Route

Existing EOR Operations
Existing Green Pipeline

Figure 2.3-1
Waterbodies and FEMA Floodplains
Calcasieu Parish, Louisiana

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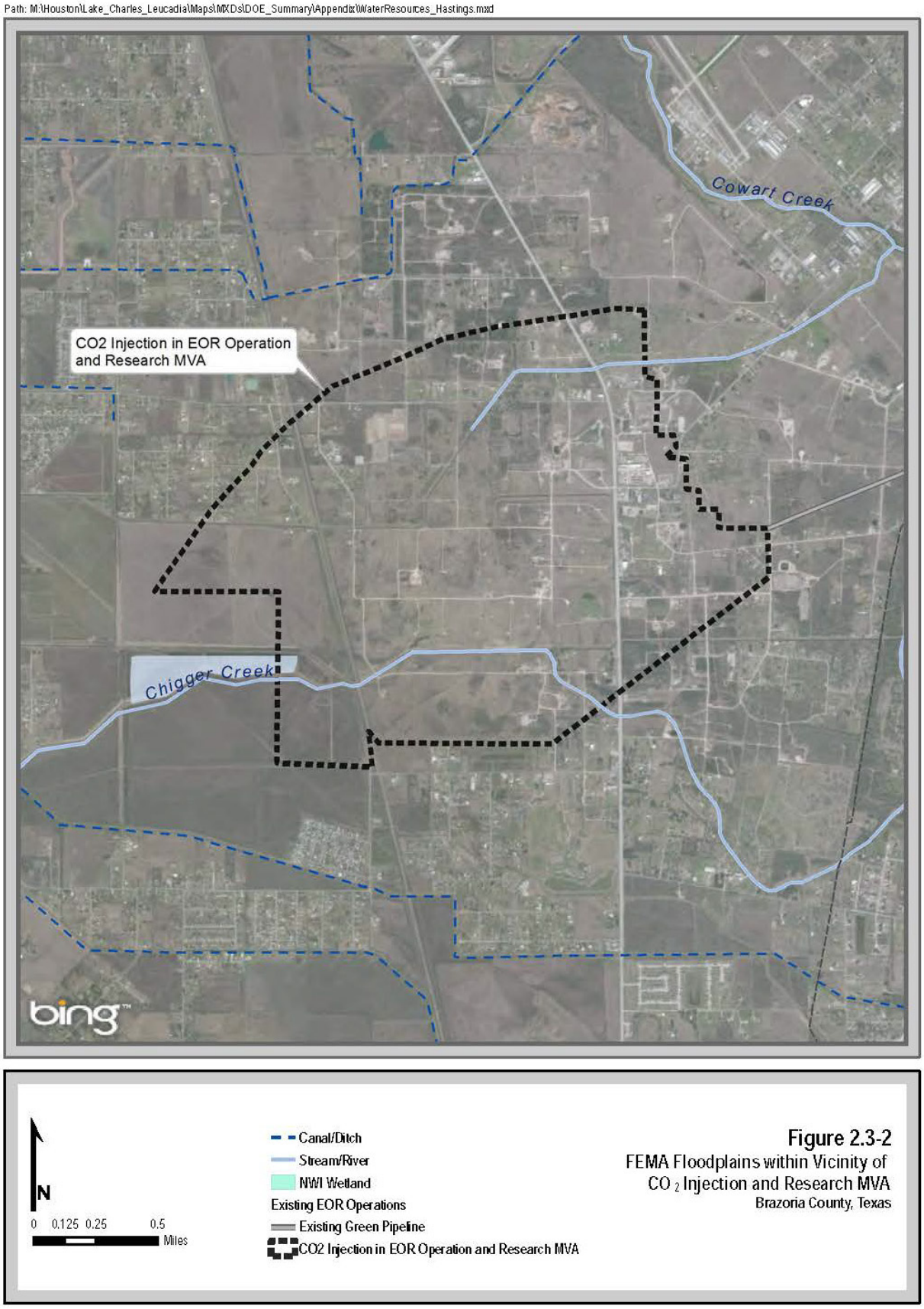


Figure 2.3-2
FEMA Floodplains within Vicinity of CO_2 Injection and Research MVA
Brazoria County, Texas

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assessment through its issuance of the waiver. **Additionally, the USACE evaluated the construction of the 70-acre site including the fill and associated bulkhead in 2007.**

The USACE and FEMA received copies of the DEIS and provided no comment on floodplain impacts. DOE defers to the judgment of agencies with primary responsibility of floodplain management regarding the issuance of permits and waivers and any requirements for the site owner.

Construction of the LCCE Gasification plant would not encroach upon the regulatory floodway which is the Calcasieu River or alter the navigability of the Calcasieu River. Leucadia would coordinate with the Coast Guard and USACE during construction of permitted bulkheads **to** avoid impacts to navigation on the Calcasieu River **for that period of time**. **By changing the land use from an undeveloped area to buildings, the permeability of the site would be modified**. However, given the site size, 70 acres, compared to the 2,240,000 acre watershed area of the Calcasieu River, the increase in **surface water** runoff would **be negligible and** not significantly increase flow volumes downstream.

Wetlands

The USACE conducted a jurisdictional determination on the Gasification Plant site and determined that construction of the Plant affected 26.2 acres of forested and emergent marsh wetlands along the Calcasieu River. The USACE required compensatory mitigation to offset the impacts to wetlands and the Port of Lake Charles mitigated the impacts to 26.2 acres of the wetlands through an agreement with the USACE and Stream Wetland Services, LLC in 2008.

3.1.1.2 Off-Site Activities

Construction Parking

Floodplains. The proposed offsite 5-acre construction parking area is an upland undeveloped parcel of land. Portions of the area proposed for temporary construction parking are located within the 100-year floodplain of the Calcasieu River. Prior to construction, local building permits would be obtained, including NPDES permit and coordination with the local Calcasieu Parish floodplain administrator. The temporary offsite construction parking area would only be utilized during the 3-year construction period of the LCCE Gasification plant. After site clearing and compacting, approximately 4 to 6 inches of gravel fill would be placed over the 5-acre area to create a level, firm surface for the parking of automobiles. The placement of gravel on the construction parking area would negligibly raise elevations within the floodplain and would not increase the potential for floods, conflict with applicable flood management plans or ordinances, or conflict with the FEMA's national standard for floodplain management. Therefore, no impacts to floodplain would occur from construction of the construction parking area.

Wetlands. No wetlands are present within the location proposed for the offsite construction parking area, therefore no wetland impacts would occur. An open water feature is present immediately west of the proposed location and is a man-made borrow pit for sand and would be classified as a non-jurisdictional open water pond. Local drainage pattern and site grading would direct any runoff from the parking area and not result in direct impacts to this open water feature.

A potential wetland is present approximately 700 feet southeast of the proposed parking area; however, the parking area is physically separated from this potential wetland by LA 108. No impacts to wetlands would occur from the construction of the offsite construction parking area.

Equipment Laydown and Methanol/Sulfuric Acid Storage

Floodplains. The 120-acre area, of which 40 acres would be used for equipment laydown during construction and methanol/sulfuric acid storage during operation, is within the 100-year floodplain of the Calcasieu River. DOE assumes that the site would be filled above FEMA's base flood elevation. The Port of Lake Charles, the site owner, would coordinate with the local floodplain administrator on a drainage impact analysis to avoid any likelihood of impacts on local flooding because construction of the equipment laydown area would impact 40 acres of 100-year floodplain of Bayou d'Inde and/or Calcasieu River. DOE has assumed 100% floodplain coverage to assess the maximum potential disturbance for its floodplain impact analysis. DOE also assumed for this analysis that the site would be filled and elevated above the floodplain which would divert flood waters locally, resulting in the potential to alter local floodwater flow patterns on adjacent properties. However, flood waters are conveyed in this vicinity through the designated floodway of the Calcasieu Ship Channel and River which drains the 2.24 million-acre Calcasieu watershed. This designated floodway below the project site extends 8 miles along the ship channel and encompasses 3,976 acres. The 120-acre site is not within this designated floodway. Given the size of the 40-acre site compared to the drainage area of this floodway, 40 acres of fill would not result in a measurable increase in the upstream base flood elevation as determined by FEMA, nor have a measurable effect on the performance of the designated floodway. However, the local floodplain administrator and USACE would require permits for construction to ensure there is no conflict with applicable local flood management plans or ordinances or FEMA national standard for floodplain management.

Wetlands. The 120-acre area, including 40 acres for equipment laydown during construction and methanol/sulfuric acid storage during operation, contains approximately 40 acres of wetlands associated with the open water areas. Construction of the equipment laydown area could result in the filling of up to 40 acres of wetlands. DOE assumed 100% wetland coverage of the 40 acres to assess the maximum potential disturbance. The equipment laydown area is within a 275-acre remaining forested wetland along this portion of Bayou d'Inde. A loss of 40 acres of forested wetland from this 275 acre-forested wetland represents 14.5 % loss. However, the Bayou d'Inde watershed is approximately 8,640 acres in size and has approximately 2,583 acres of forest remaining, of which approximately half is forested wetland. A similarly sized forested wetland of 388 acres is within 2 miles southeast along the Calcasieu River. Additionally, the Calcasieu River watershed below the site is approximately 706,752 acres and a majority of it is open water and wetlands, particularly south of Moss Lake. A loss of 40 acres of wetlands within the Bayou d'Inde watershed would represent less than 3 percent of the wetlands present within the watershed. A total of 116,791 acres of wetlands in the Calcasieu-Sabine Basin have converted to open water since 1932 (USGS 2007).

The USACE New Orleans District, Regulatory Branch has jurisdiction over the project in Louisiana; therefore, the project would follow guidelines to evaluate impacts and mitigate. Once the location for the 40-acre area is finalized, the potential wetland impacts would be determined through field surveys and the USACE permit application process. The permitting would determine the need, appropriateness, and quantity of compensatory mitigation, and assure that the required mitigation is consistent with legal requirements. Therefore, through the USACE permit process and its "no-net loss" policy, impacts to wetlands would be expected but offset by mitigation.

Linears for Natural Gas, Potable Water, Transmission, Sulfuric Acid, and Methanol

Floodplains. The proposed natural gas, potable water, sulfuric acid and methanol pipelines would be installed below ground within the 100-year floodplain of Bayou D'Inde and Calcasieu River. Because these linears would be installed below grade, no floodplain filling would occur. The transmission line pole footings would also be below grade. The approximate area associated with these linears is 6 acres. There would be no measurable decrease in infiltration rates that could increase downstream volumes as a result of installation of the linears because of their relative size to the much larger floodplain area. Because the linears are installed below ground and their footprint is relatively small by comparison, the construction of these linears would result in no impacts to the floodplain. Prior to construction, Leucadia would obtain applicable permits and undertake coordination with the Calcasieu Parish floodplain administrator and would therefore not conflict with applicable local flood management plans or ordinances or FEMA national standard for floodplain management.

Wetlands. There are no wetlands present within the locations proposed for the offsite linears, therefore no wetland impacts would occur.

Raw Water Pipeline and Hydrogen Pipeline

Floodplains. The proposed raw water supply pipeline would be approximately 4 miles in length and have a footprint of approximately 24.2 acres, given a ROW width of 50 feet. The hydrogen pipeline would be approximately 8.5 miles in length and have a footprint of approximately 77.3 acres, given a ROW of 75 feet. Both pipelines were sited consistent with Leucadia's siting criteria. The raw water and hydrogen pipelines would occupy 76% and 99% of existing ROW, respectively. Due to the relatively narrow nature of the permanent pipeline ROW and the temporary construction ROW, no measurable alteration of infiltration rates would occur. Additionally, these pipelines are installed below the ground surface and would not fill or elevate the floodplain. Therefore, no substantial decrease in the volume of surface water that flows downstream would result. Because the pipeline would be buried, it would not result in a fill above the existing ground elevations and have a no permanent effect on surface storm water flow patterns or flooding and would not conflict with applicable local storm water management plans. Pipeline construction permitted under the USACE permit and local building permits would not alter a floodway or floodplain or otherwise impede or redirect flows in a manner that would increase the potential for floods or impacts on human health, the environment, or personal property, nor would construction conflict with applicable local flood management plans or parish

ordinances. Therefore, permitted pipelines would not conflict with FEMA's national standard for floodplain management.

Wetlands. A desktop review identified potential wetlands within the proposed footprints of the raw water and hydrogen pipelines using the U.S. Fish and Wildlife Service's NWI maps, the U.S. Department of Agriculture' Soil Survey of Calcasieu Parish for indications of wetlands (hydric) soils, and regional aerial photographs. These pipelines would extend approximately 4 miles and 8.5 miles, respectively. Tables 3.1-1 and 3.1-2 summarize the potential wetland impacts that may result from construction of the raw water supply and hydrogen pipelines which are 3.55 acres and 3.59 acres, respectively. The estimate of wetland impacts presented in Table 3.1-1 assumes the use of an open-lay construction method, the worst-case scenario; however, in some cases, horizontal directional drilling (HDD) method would be used for construction, and the acreage of wetland impacts could be avoided or reduced..

Table 3.1-1 Potential Wetland Impacts by Segments for the Raw Water Supply Pipeline

Segment	Length (feet)	Square Feet	Acres
2	5	500	0.01
7	45	4,500	0.1
8	1,500	150,000	3.44
Total			**3.55**

Source: URS 2012.
Note: The potential impact estimate is based on the use of an open-lay construction method and is a worst-case estimate.

Table 3.1-2 Potential Wetland Impacts by Segment for the Hydrogen Pipeline

Segment	Length (feet)	Square Feet	Acres
4	25	2,500	0.06
6	15	1,500	0.07
8	36	3,600	0.08
10	85	8,500	0.08
12	770	77,000	1.8
16	650	65,000	1.5
Total			**3.59**

Source: URS, 2012
Note: The potential impact estimate is based on the use of an open-lay construction method and is a worst-case estimate.

The USACE regulates, discharges of dredged, excavated, or fill material into U.S. waters (rivers, streams, and bayous), including associated wetlands, and the placement of structures in navigable waters such as that associated with construction of pipelines under Sections 9 and 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Requirements under the applicable regulations include identifying waters of the U.S., including wetlands; assessing the potential impacts on waters of the U.S.; and modifying plans to first avoid impacts to the extent practicable, then minimize impacts, or finally, to fully mitigate for unavoidable impacts. The regulations also require obtaining permits, either through preconstruction notification, a Nationwide Permit, or an Individual Permit, depending on the level of impact. For segments of

the pipelines with the potential to impact wetlands, a site-specific survey would be required to quantify any potential wetland impacts and determine wetland type and functional value. If a water body, including wetlands, would be crossed by the proposed pipeline route and is determined to be a water of the U.S. (jurisdictional), the potential construction impacts on wetlands would be determined. HDD crossing method would be used in specially designated stream crossings, such as crossing Bayou D'Inde or the Houston River. HDD method involves using specialized equipment to install pipelines beneath the surface water, i.e. wetlands or waterways, which potentially minimizes environmental impacts. However, adverse impacts could occur, such as turbidity and deposition of drilling muds, due to the inadvertent back up of drilling muds during the drilling process. These potential impacts must be reported immediately and cleaned up typically with full restoration and mitigation with an HDD failure contingency plan and/or drilling mud disposal plan. The applicability of this method is subject to a variety of site-specific physical and engineering factors and specified in the actual permit to be obtained for pipeline installation. Therefore, this method is applicable to water bodies with conditions determined to be suitable and after extensive assessment and permitting for both environmental and engineering considerations. Once applicable crossing methods are determined and if applicable wetland impact thresholds would be exceeded, Leucadia would obtain the necessary USACE Permit. During construction Leucadia would implement BMPs to minimize potential impacts. If a USACE permit is required for construction, Leucadia would perform compensatory mitigation as directed by the USACE to minimize impacts to the extent practicable.

Leucadia would choose one of four water body crossing methods, including implementing HDD construction method, to avoid and/or minimize wetland impacts. Use of the appropriate water body crossing method that avoids wetland impacts would result in no mitigation being necessary. However, permitted wetland impacts would be fully offset with specified mitigation.

Leucadia would obtain local building permits and USACE permits to cross navigable waters and wetlands. Leucadia would comply with the applicable requirements such that pipeline construction would not significantly alter storm water discharges, adversely affect drainage patterns, increase flooding, or result in erosion or sedimentation that would violate water quality standards.

3.1.2 Operation

3.1.2.1 Gasification Plant

Floodplains. Operations would not increase the potential for floods, alter a floodway or floodplain or otherwise impede or redirect flows such that human health, the environment or personal property could be affected, nor conflict with applicable local or FEMA flood management plans or ordinances. Therefore, no floodplain impacts would occur as a result of operation of the Gasification Plant.

Wetlands. Operations of the Gasification Plant would not result in any additional wetland fills.

3.1.2.2 Off-Site Activities

Construction Parking

Floodplains. The off-site parking area would be used temporarily during the 3-year construction period of the LCCE Gasification plant. Use of the parking area would be discontinued once construction of the gasification project is completed. No floodplain impacts would occur as a result of terminating the use of the parking area.

Wetlands. No wetland impacts would occur as a result of terminating the use of the parking area.

Equipment Laydown and Methanol/Sulfuric Acid Storage

Leucadia would conduct operational activities in accordance with required federal and state permits and would comply with water quality standards and discharge limitations stipulated in the permits such that surface water impacts from storm water runoff would be minor and would not degrade surface water quality by increasing erosion or sedimentation, or by introducing contaminants. All methanol and sulfuric acid tanks would be surrounded by impermeable containment berms to contain leaks or spills and prevent offsite discharges. In addition, Leucadia would:

- Use good housekeeping practices to keep exposed areas clean;
- Regularly inspect, test, maintain, and repair all industrial equipment and storage sites to avoid situations that may result in leaks, spills, and other releases of pollutants in stormwater discharges that could affect floodplains and wetlands water quality;
- Minimize the potential for leaks, spills and other releases that may be exposed to stormwater and develop plans for effective response to such spills if or when they occur;
- Stabilize exposed area and contain runoff using structural and/or non-structural control measures to minimize onsite erosion and sedimentation, and resulting discharge of pollutants;
- Divert, infiltrate, reuse, contain or otherwise reduce stormwater runoff, to minimize pollutants in discharges to floodplains and nearby wetlands; enclose or cover storage piles; and
- Train all employees who work in areas where industrial materials or activities are exposed to stormwater; and ensure that waste and floatable debris are not discharged in receiving floodplains and waters, including wetlands.

Therefore, potential impacts to floodplain and wetland water quality in the unlikely event of leaks or spills would be avoided or minimized, and/or cleaned up effectively.

Floodplains. Once construction of the LCCE Gasification plant is completed, use of the equipment laydown area would be discontinued and the site would be used for methanol and sulfuric acid storage. No additional floodplain fills and/or impacts are anticipated during operation of the storage area and no additional floodplain impacts would occur as a result of operation of the storage area.

Wetlands. No additional wetland fills would occur as a result of normal operational activities of methanol/sulfuric acid storage.

Linears for Natural Gas, Potable Water, Transmission, Sulfuric Acid, and Methanol

In the event of leaks and spills that could impact floodplain and wetland water quality, see discussion above under equipment laydown and storage site.

Floodplains. No floodplain fills and/or impacts are anticipated during operation of the proposed linears. Routine maintenance activities along permanent ROW would not increase the potential for floods, alter a floodway or floodplain or otherwise impede or redirect flows such that human health, the environment or personal property could be affected, nor conflict with applicable local or FEMA flood management plans or ordinances.

Wetlands. No additional wetland fills would occur as a result of normal activities of routine maintenance along the permanent linears ROW.

Raw Water Supply and Hydrogen Pipelines

Floodplains. No floodplain impacts are anticipated from raw water supply and hydrogen pipeline operations because no floodplain filling would occur during operations. Due to the relatively narrow nature of the permanent pipeline ROW, no measurable alteration of infiltration rates would occur during pipeline maintenance activities. Maintenance activities would involve visual inspection of pipeline ROW and leak detection monitoring via sensors which do not involve floodplain filling. Additionally, no decrease in the volume of surface water that flows downstream would result because the pipelines are underground during operations. Because the pipelines would remain buried, no fill above the existing ground elevations and no effect on surface storm water flow patterns or flooding would occur during operations and operational activities would not conflict with applicable local storm water management plans.

Wetlands. No wetland fills would occur as a result of normal pipeline operations and maintenance activities.

3.2 Lake Charles CCS Project

3.2.1 CO_2 Capture and Compression Facilities

3.2.1.1 Construction

Floodplains. During construction of the LCCE Gasification plant, 70 acres of floodplain were filled as described in Section 3.1.1.1. As a result, no additional floodplain filling would occur from CO_2 Capture and Compression facilities construction.

Wetlands. During construction of the LCCE Gasification plant, 26.2 acres of wetland filling was permitted under USACE Section 404 permit as described in Section 3.1.1.1. As a result, no additional wetland fills would occur from CO_2 Capture and Compression facilities construction.

3.2.1.2 Operation

Floodplains. Operations would not result in floodplain fills or alteration of infiltration rates that would increase volumes downstream. No impacts to floodplains would occur as a result of operation of the CO_2 Capture and Compression facilities.

Wetlands. Operation of CO_2 Capture and Compression facilities would cause no impacts to wetlands.

3.2.2 CO_2 Pipeline
3.2.2.1 Proposed Route
3.2.2.1.1 Construction

Floodplains. The proposed CO_2 pipeline route would be approximately 11.1 miles in length and have a footprint area of approximately 33.6 acres. This route would be located within the 100-year floodplain of the Calcasieu River and Bayou D'Inde. Due to the relatively narrow nature of the permanent pipeline ROW and the temporary construction ROW compared to the size of the floodplain and the fact the pipeline would be buried, no alteration of infiltration rates would be expected. There would also be no substantial decrease in the volume of surface water that flows downstream. The preferred route would permanently impact 14.98 acres and temporarily impact 13.23 acres of 100-year floodplain (CH2MHill 2011). See table 3.2-2. Pipeline construction affecting floodplain would require coordination and approvals from the Calcasieu Parish floodplain administrator. Additionally, floodplain associated with Calcasieu River and Bayou D'Inde typically includes wetlands. Impacts to wetlands would require USACE permits. Based on receipt of local approvals for pipeline installation within the floodplain and USACE permits to cross waters of the U.S., including associated wetlands, approved and permitted pipeline construction should not significantly alter storm water discharges, nor would it adversely affect drainage patterns and flooding, because the pipeline would be buried.

Because the pipeline would be buried, it would not have a permanent effect on surface storm water flow patterns or flooding and would not conflict with applicable local storm water management plans. Pipelines permitted and constructed under the USACE permit and local building permits would not alter a floodway or floodplain or otherwise impede or redirect flows in a manner that would increase the potential for floods or impacts on human health, the environment, or personal property, nor would construction conflict with applicable local flood management plans or parish ordinances. Therefore, the permitted pipeline would not conflict with FEMA's national standard for floodplain management because no fill above existing ground elevations would occur.

Wetlands. Construction of the proposed pipeline across wetlands would result in short-term disturbances to wetland hydrology and, where new permanent ROW is required, long-term disturbance in the form of functional conversion from forested or scrub-shrub wetlands to

emergent wetlands. Impacts from in-stream disturbances would occur during construction and restoration activities at each pipeline crossing of a water body. The proposed 11.9-mile-long pipeline route involves 21 water body crossings, including two major water bodies: the Houston River and Bayou d'Inde; and the Sabine River Canal. A majority of the route would be collocated within existing utility easements, as identified in Table 3.2-1 below.

Table 3.2-1 Co-location of the Proposed Lake Charles Pipeline Lateral Project with Existing Easements and Rights-of-Way

County/State/Owner	Begin Milepost	End Milepost	Total Miles Paralleled	Type of Easement	Width of Existing Easement (feet)	Direction from Existing Easement	Width Used for Temporary Construction Easement (feet)[a]
Gulf States Utilities	0.5	0.8	0.3	Power Line	75[b]	West	0
Calcasieu Parish	1.4	2.0	0.6	Road (Bayou D'Inde Pass/ Prater Road)	55[c]	East	0
Shell Pipeline Easement	2.5	2.9	0.4	Pipeline	30[b]	East	0
Petrologistics Easement	2.9	3.3	0.4	Pipeline	25[b]	Northwest	0
Air Products Easement	3.9	4.5	0.6	Pipeline	30[b]	Southwest	0 to 25
Kansas City Railroad	4.5	5.6	1.1	Railroad	100[c]	Southwest	0 to 7
Beauregard Electric	5.6	6.8	1.2	Power Line	55[c]	Southwest	30 to 50
Kansas City Railroad	6.8	7.4	0.6	Railroad	100[c]	Southwest	0 to 20
Air Products Easement	7.4	7.5	0.1	Pipeline	35[b]	East	11 to 14
Air Products Easement	7.6	7.7	0.1	Pipeline	35[b]	East	7 to 10
Kansas City Railroad	7.7	8.1	0.4	Railroad	100[c]	West	25 to 35
Entergy Easement	8.4	10.1	1.7	Power Line	100[b]	Southwest	0
Calcasieu Parish	10.7	11.1	0.4	Road (Bankens Road)	60[c]	North	0 to 11
Total Pipeline Miles Paralleled			**7.9** [d]				

Source: CH2MHIll 2011.

[a] Width is based on the potential of overlap with the existing easement. Consultations and legal agreements with existing easement owners would be finalized prior to construction.
[b] Easement width was estimated based on the county's tax lot/parcel data set.
[c] Existing easement width was estimated from the maintained corridor width detailed on aerial photography.
[d] Not all listed easement/ROW calculations are counted toward the total collocation length of the Project. Where the proposed Project route is collocated with two or more additional ROWs, due to collocation of two or more landowners at one time, only one easement/ROW collocation is counted toward the total collocation length of the Denbury Project.

Pipeline route is co-located as much as practicable to avoid and/or minimize wetland impacts. As described in Section 4.4.2.1.2 of the Lake Charles CCS Project DEIS, Water Supply and Hydrogen Pipeline Construction, there are four proposed surface water crossing methods. A water body crossing method is selected to avoid and/or minimize impacts to the water body, including wetlands. Denbury proposes to cross specially designated perennial waterbodies, including wetlands, using horizontal directional drill (HDD) method; and to cross other surface waters using crossing methods 1 through 3, as described above, with conventional pipeline crossing techniques, potentially including both wet and dry trenching methods, which include full restoration of a site after construction (CH2MHill 2011).

According to the pre-construction notification to the USACE, construction of the CO_2 pipeline along the preferred route would temporarily affect approximately 8.01 acres of wetlands and 4.96 acres of wetlands during operation and permanently impact 3.68 acres of wetlands (CH2MHill 2011).

Approximately 0.91 acres of forested and scrub-shrub wetlands would be permanently converted into emergent wetlands within the permanent ROW by the construction and operation of the pipeline, while 1.96 acres of forested wetlands would be cleared during construction but allowed to revegetate to forested wetlands in the longer term following construction (see Table 3.2-2). To minimize impacts on waters of the U.S., including wetlands, the corridor would be reduced to 75 feet from 95 feet, and consist of 50 feet of permanent ROW and 25 feet of temporary ROW through wetlands. Impact analysis considered 8.01 acres of temporary construction impacts and 4.96 acres of temporary operation impacts.

Table 3.2-2 Summary of Potential Surface Water, Wetland, and Floodplain Impacts of the Proposed Route (acres)

	Proposed
Number of major water body crossings	2
Number of minor water body crossings	4
Total wetlands	3.68
Forested Wetlands	1.71
Total Permanent Wetland Impacts [a]	0.91
Total Long-Term Temporary Wetland Impacts [b]	1.96
Floodplain Permanent Impact	14.98

Source: CH2MHIll 2011.

[a] Permanent conversion from forested wetland to emergent wetland within the permanent ROW.

[b] Temporary clearing impacts allowed to restore to forested/scrub-shrub wetlands within the temporary construction ROW.

[c] Floodplain impacts also include additional 13.23 acres of temporary impacts

Denbury would perform construction in accordance their BMP's to **avoid or** minimize potential impacts to the extent practicable and would comply with all standards and compensatory mitigation required by applicable federal and state permits. Potential permitted wetland impacts would be fully offset with specified mitigation under applicable federal and state permits. During construction, impacts are minimized through various mitigation measures, which are dependent on location-specific restrictions, available space, and regulatory constraints that may exist (CH2MHill 2011). Denbury's mitigation measures include the following:

- Strip topsoil separately, stockpile for re-use during restoration, and place soils derived from construction work at locations of smaller water body crossings within the pipeline construction ROW at least 10 feet from the water's edge and separated with silt fencing, or in additional specified work areas separated from the surface water body.

- Maintain the minimum required buffer distance from water bodies during refueling of construction equipment, or, when this cannot be achieved, the construction contractor would employ secondary containment methods and would establish other appropriate spill

prevention and cleanup measures to minimize the potential for any accidental spill-related impacts.

- Adhere to the following guidelines when in proximity to any major water bodies or delineated wetlands for which additional temporary workspace would be necessary for staging:
  - Locate additional staging areas, additional soil storage areas, or other additional work areas at least 50 feet away from the water's edge, unless the adjacent upland area is cultivated cropland or other disturbed land, in which case the buffer may be less;
  - Minimize the clearing of vegetation between any additional required staging/storage areas and the water body or within the ROW of the pipeline; and
  - Establish and clearly mark buffer areas separating water bodies from designated refueling and staging areas.

Mitigation for impacts on waters of the U.S., including wetlands, would include in situ rehabilitation of wetlands temporarily impacted by construction, and the purchase of mitigation credits from approved wetland mitigation banks in the affected watersheds (i.e., the Lower Calcasieu watershed (Hydrological Unit Code [HUC] 08080206) and the West Fork Calcasieu watershed (HUC 08080205) (CH2MHill 2011). Emergent wetlands and forested wetlands temporarily cleared for construction would be restored to pre-existing contours and hydrology and allowed to revegetate to pre-existing conditions. To compensate for long-term or permanent conversions of forested and scrub-shrub wetlands to emergent wetlands, Denbury proposes to purchase credits from wetland mitigation banks in the affected watershed areas (see Table 3.2-3).

Table 3.2-3 Compensatory Wetland Mitigation for the Lake Charles Pipeline Lateral Project

Wetland Type	Permanent Conversion to PEM Wetland (acres)[a]	Long-Term Temporary (acres impacted)[b]
Palustrine/Estuarine Forested		
HUC 08080206	0.35	0.22
HUC 08080205	0.36	1.49
Total Palustrine/Estuarine Forested	0.71	1.71
Palustrine/Estuarine Scrub-Shrub		
HUC 08080206	0.20	0.25
Total Palustrine/Estuarine Scrub-Shrub	0.20	0.25
Total	**0.91**	**1.96**

Source: CH2MHill 2011.
[a] Permanent conversion from forested wetland to emergent wetland within the permanent ROW.
[b] Temporary clearing impacts on forested/scrub-shrub wetlands within the temporary construction ROW.

Operation

Floodplains. No additional floodplain impacts are anticipated from operation of the proposed CO2 pipeline because no floodplain filling would occur from operational activities along the installed pipeline. The pipeline would remain buried during normal operations. Therefore, no alteration of infiltration rates would occur during pipeline maintenance activities and no decrease in the volume of surface water that flows downstream would result. Because the pipeline would be buried, it would not result in a fill above the existing ground elevations and

no effect on surface storm water flow patterns flooding, or local storm water management plans would occur.

Wetlands. No impacts to wetlands would occur as a result of normal CO_2 pipeline operations.

3.2.2.2 Alternative Pipeline Route B

3.2.2.2.1 Construction

Floodplains. The alternative pipeline route would be approximately 11.6 miles in length and involve a temporary construction ROW width of 95 feet. Construction impacts and requirements would be the same as discussed above in Section 3.2.2.1.1 for construction of the preferred route. However, the alternative route would impact more floodplain area because of its location and additional length. Construction of the Alternative CO2 pipeline would result in 16.67 acres of permanent floodplain impacts and 14.57 acres of temporary floodplain impacts. Due to the relatively narrow nature of the permanent pipeline ROW and the temporary construction ROW when compared to the larger floodplain size, no alteration of infiltration rates would be expected. The alternative pipeline route would also be buried and therefore, no decrease in the volume of surface water that flows downstream would result.

Wetlands. Table 3.2-4 summarizes the surface water and wetland impacts of the alternative pipeline compared to the proposed CO2 pipeline route. The alternative route contains 55.8 acres of wetlands (49.6 acres forested) within the construction corridor (CH2MHill 2011). The alternative route would involve two major water body crossings and nine perennial water body crossings (versus the crossing of two major water body and four perennial streams for the proposed route). The alternative route would impact 26.29 acres of wetland (versus 2.87 acres for the proposed route). The alternative route would permanently impact 16.67 acres and temporarily impact 14.98 acres of 100-year floodplain (CH2MHill 2011).

Table 3.2-4 Summary of Potential Surface Water, Wetland, and Floodplain Impacts of the Alternative CO2 Pipeline Route Compared to the Proposed Route, acres

	Alternative	Proposed
Number of major water body crossings	**2**	**2**
Number of minor water body crossings	**9**	**4**
Total wetlands	55.8	3.68
Forested wetlands	49.6	1.71
Total Permanent and Temporary Wetland Impacts	26.29	2.87
Floodplain[a] Permanent Impact	16.67	14.98

Source: CH2MHill 2011.
[a] Floodplain impacts also include an additional 14.57 acres of temporary impacts.

Wetland impacts would require a USACE Section 404 permit prior to construction as described in Section 3.2.1.1.1 for the proposed CO2 pipeline route. Because there would be a greater wetland impact, additional mitigation would be required to offset permitted wetland impacts.

Operation

Operation of the pipeline along the alternative route would be the same as described above for proposed pipeline route and would result in the same level and type of impacts as described above in Section 3.2.1.1.1.

Floodplains. No floodplain impacts are anticipated during operations. Operation of the pipeline along the alternative route would be the same as described above for proposed pipeline route and would result in the same level and type of impacts as described above in Section 3.2.1.1.1.

Wetlands. No wetland impacts are anticipated during operations. Operation of the pipeline along the alternative route would be the same as described above for proposed pipeline route and would result in the same level and type of impacts as described above in Section 3.2.1.1.1.

3.2.2.3 Research MVA

Floodplains. No floodplain impacts would occur. The MVA project area includes Cowart Creek draining northeast from the existing Hastings Field and Chigger Creek draining to the southeast. The Hastings Field MVA area is shown on the FEMA FIRM Panels 48039C0135I, revised September 22, 1999, 48039C0045J, revised September 22, 1999, 48039C0065J, revised September 22, 1999, and 48039C0175I, revised September 22, 1999. Areas identified as Special Flood Hazards inundated by the 100-year floods (Zones A, AE, and AO) occur within short distances, from 100 to 2,000 feet, of Chigger and Cowart Creeks. The southern approximately one third of the Hastings oil field, including two proposed well locations in the MVA, is located within the 100-year floodplain of Chigger Creek. However, MVA activities do not involve construction and no floodplain filling would occur as a result of MVA activities. Therefore, there would be no increase in the potential for floods, nor alteration of a floodway or floodplain. The MVA activities would not conflict with local applicable flood management plans or ordinances and would not conflict with FEMA's national standard for floodplain management because no floodplain filling is involved.

Wetlands. The NWI indicates that several wetlands are present within the West Hastings Field MVA area, mainly in the vicinity of Chigger Creek. Project wells and construction areas would be located outside of wetland areas and best management practices would be utilized to prevent runoff from entering wetlands outside of construction areas (AIPC 2011). Therefore, no fill of wetlands or reduction in wetland value would occur.

4 Alternatives

4.1 Alternatives to the Proposed Action and Connected Action

DOE's alternatives to the Lake Charles CCS Project consisted of the 83 technically acceptable applications received in response to the *Funding Opportunity Announcement, Carbon Capture and Sequestration from Industrial Sources and Innovative Concepts for Beneficial CO_2 Use (DE-FOA-0000015).* Prior to selection, DOE made preliminary determinations regarding the level of review required by NEPA based on potentially significant impacts identified in reviews of acceptable applications. DOE conducted these preliminary environmental reviews pursuant to 10 CFR §1021.216. These preliminary NEPA determinations and reviews were provided to the selecting official, who considered them during the selection process.

Because DOE's proposed action is limited to providing financial assistance in cost-sharing arrangements to projects submitted by applicants in response to a competitive funding opportunity, DOE's decision is limited to either accepting or rejecting the project as proposed by the proponent, including its proposed connected action which encompasses the technology, sites, and pipeline routes selected by the applicant. DOE's consideration of reasonable alternatives is, therefore, limited to the technically acceptable applications and a no action alternative for each selected project.

5 Findings

DOE reviewed the applicant's siting criteria and the potential impacts to floodplains and wetlands**. A**s a result of locati**on requirements, i.e., being adjacent to navigable waters and existing rail and road and pipeline infrastructure,** the proposed project and connected action **were found to have** no practicable **siting** alternatives. **Based upon** DOE**'s review and the project proponents' coordination with the local floodplain administrator and local USACE District,** adoption of **minimization measures, and application for and acquisition of the applicable Clean Water Act permits with compensatory mitigation, DOE's** proposed action will **not result in** potential harm to or within floodplains or wetlands, which is consistent with the policies set forth in E.O. 11988 and E.O. 11990, to the maximum extent practicable. DOE**'s** Floodplain Statement of Findings **is provided as Attachment 1 to this appendix.**

Attachment 1

Floodplain Statement of Findings

Department of Energy Financial Assistance to Leucadia Energy, LLC

Lake Charles CCS Project in Lake Charles, LA, and the West Hastings Oil Field, TX

AGENCY: U.S. Department of Energy

Office **ACTION:** NEPA Final EIS

SUMMARY: In accordance with U.S. Department of Energy (DOE) regulations contained at 10 CFR 1022, Compliance with Floodplain and Wetlands Environmental Review Requirements, DOE has conducted a floodplain assessment that analyzed the potential impacts associated with the Lake Charles CCS project and Lake Charles Clean Energy, LLC (an affiliate of Leucadia Energy, LLC). DOE's proposed action would provide financial assistance to Leucadia under the Industrial Carbon Capture Sequestration (ICCS) Program to support construction and operation of Leucadia's Lake Charles CCS project. DOE proposes to provide Leucadia with up to $261.4 million, which would constitute about 60 percent of the estimated $435.6 million total development cost and capital cost of the project. The purpose and need for DOE action is to advance the ICCS program by providing financial assistance to projects that have the best chance of achieving the program's objectives as established by Congress: demonstrating the next generation of technologies that will capture CO_2 emissions from industrial sources and either sequester or beneficially use the CO_2.

The Lake Charles CCS project would demonstrate the capture of carbon dioxide (CO_2) from an industrial facility for use in an existing, commercial enhanced oil recovery (EOR) operation in the West Hastings oil field. The industrial source of CO_2 would be a newly constructed gasification plant that converts petroleum coke into hydrogen gas, methanol, and other products. Lake Charles Clean Energy, LLC (an affiliate of Leucadia Energy, LLC) would build and own the gasification plant and the Lake Charles CCS project's proposed CO_2 capture and compression facilities. An affiliate of Denbury Onshore, LLC (Denbury) would construct, own and operate the new CO_2 pipeline connecting to the existing Green Pipeline. Denbury would use the captured CO_2 in its existing commercial EOR operation. Leucadia would jointly fund the research MVA program performed at the West Hastings oil field. Denbury and the University of Texas Bureau of Economic Geology (BEG) would design and implement the West Hastings Research MVA program. The research MVA will be conducted in conjunction with existing commercial EOR operations at the West Hastings oil field and will supplement regulatory requirements and Denbury's privately funded commercial monitoring activities. The Lake Charles CCS project would be designed to capture and sequester approximately 5.2 million tons of CO_2 per year that the facility would otherwise emit. The West Hastings research MVA program is aimed at providing an accurate accounting of approximately 1 million tons of stored CO_2 and a high level of confidence that the CO_2 will remain sequestered permanently in historic oil-producing geologic formations located approximately 6,500 feet below the land surface.

The Lake Charles CCS Project CO_2 pipeline would cross Bayou d'Inde and the Houston River using HDD construction methods. The pipeline route would potentially permanently impact 9.98

acres and temporarily impact 9.02 acres of wetland and permanently impact 14.98 acres and temporarily impact 13.23 acres of 100-year floodplain. The LCCE Gasification plant would have additional floodplain and wetland impacts at the 40-acre site of the equipment laydown area and methanol/sulfuric acid storage area. The water supply pipeline would cross Bayou d'Inde and Bayou Verdine and impact 3.55 acres of wetlands. The hydrogen pipeline would cross Bayou d'Inde, the Sabine River Canal, and two additional waterbodies using HDD construction methods and impact 3.59 acres of wetlands.

Because DOE's proposed action is limited to providing financial assistance in cost-sharing arrangements to projects submitted by applicants in response to a competitive funding opportunity, DOE's decision is limited to either accepting or rejecting the project as proposed by the proponent, including its proposed connected action which encompasses the technology, sites, and pipeline routes selected by the applicant. DOE's consideration of reasonable alternatives is, therefore, limited to the technically acceptable applications and a no action alternative for each selected project. As a result of location requirements, i.e., being adjacent to navigable waters and existing rail and road and pipeline infrastructure, the proposed project and connected action were found to have no practicable siting alternatives.

Based upon DOE's review and the project proponents' coordination with the local floodplain administrator and local USACE District, adoption of minimization measures, and application for and acquisition of the applicable Clean Water Act permits with compensatory mitigation, DOE's proposed action will not result in potential harm to or within floodplains or wetlands.

APPENDIX F

ACCIDENT ANALYSIS AND ALOHA MODELING

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ACCIDENT ANALYSIS AND ALOHA MODELING

DOE evaluated potential release scenarios for the LCCE Gasification plant and Lake Charles CO_2 Capture and Compression equipment based on discussions with Leucadia regarding design and operation, professional judgment, comparison with prior DOE analyses, and an iterative modeling process to characterize potential scenarios for spills and releases. Although all accident scenarios were considered unlikely, the release scenarios identified were ranked according to probability. For this analysis, DOE defined the "probability" scenario as one that, while still unlikely, would be the highest probable scenario to occur based on experience or available statistical information, and, in general, would have a low consequence or impact. The "consequence" scenario was defined as a catastrophic failure that would spill or release a maximum amount of material but would have an extremely low probability of occurrence. DOE estimated the level of exposure to releases of hazardous materials to the air using the ALOHA (Areal Locations of Hazardous Atmospheres) air dispersion modeling software, which is a Gaussian plume dispersion model that evaluates release source and meteorological parameters.

ALOHA MODEL DESCRIPTION

ALOHA is a program designed to model chemical releases for emergency responders and planners. It can estimate how a toxic cloud might disperse after a chemical release and also features several fire and explosion scenarios. ALOHA displays its estimate as a threat zone, which is an area where a hazard (such as toxicity, flammability, thermal radiation, or damaging overpressure) has exceeded a user-specified Level of Concern (LOC). ALOHA can calculate how quickly chemicals are escaping from tanks, puddles (on both land and water), and gas pipelines and predict how that release rate changes over time.

ALOHA was developed jointly by NOAA and the U.S. Environmental Protection Agency (EPA) and runs on both Mac and Windows computers. ALOHA can be downloaded at this address: http://www.epa.gov/emergencies/content/cameo/aloha.htm.

ALOHA MODELING RESULTS

For this analysis, DOE assumed the worst-case atmospheric conditions during such a release, when applicable. These conditions provide conservative results because the extreme and unlikely climatic conditions maximize vaporization to create a vapor cloud and minimize its dispersion. The atmospheric conditions include:

- Temperature – The highest temperature recorded for the area in the past 3 years was 115 degrees Fahrenheit (°F). High temperatures are used because increased temperatures accelerate the vaporization rate of substances upon release.

- Average Humidity – 50 percent atmospheric humidity is used when performing the worst case scenario evaluation. An average humidity of 50 percent is found during months providing the highest temperatures for the area. This level of humidity provides low interference for chemical dispersion, but is still taken into consideration to provide conservative results.

- Wind Speed – A 1.5-meter-per-second (m/s) wind speed is used when performing the worst-case scenario evaluation (equivalent to 4.92 feet per second [ft/s]). A low-wind speed prevents the quick dispersion of vapor clouds.

- Atmospheric Stability – An atmospheric stability level of F is applied for the worst-case scenario. The F atmospheric stability provides the most stable atmospheric environment where the tendency of the atmosphere is to resist or enhance vertical motion and/or turbulence, which contributes to minimum dissipation of the vapor cloud.

Tables F-1 through F-8 provide the ALOHA inputs and modeling results for each of the chemicals of concern identified at the LCCE Gasification plant and the Lake Charles CCS project.

Table F-1 Summary of 19% Aqueous Ammona Release ALOHA Simulations					
Description	Catastrophic tank failure	Catastrophic tank failure	Catastrophic tank failure	Loaded Truck complete loss spill accident	Leaking Flange for 60 minutes
Source Type (Aloha)	Evaporating Puddle	Evaporating Puddle	Evaporating Puddle	Evaporating Puddle	Evaporating Puddle
Pipe Size (inches)	NA	NA	NA	NA	0.25
Volume (gallons)	16,500	16,500	16,500	7,000	300
Source Dimensions (ft) (length x width) berm	75 X 75	75 X 75	75 X 75	NA	NA
Source Area (Square feet)	5,625	5,625	5,625	42,000	1,800
Ground Type (wet soil, concrete, sand, etc)	Concrete	Concrete	Concrete	Sandy Soil	Concrete
Puddle Depth (inches)	NA	NA	NA	0.25	NA
Terrain option	Simple Terrain	Simple Terrain	Simple Terrain	Simple Terrain	Simple Terrain
Urban/rural	Urban	Urban	Urban	Urban	Urban
Inversion	No	Yes/500 ft	No	No	No
Cloud Cover %	100	100	0	0	100
Humidity %	63	63	63	63	63
Highest daily maximum temperatures	71	71	92	92	92
Stability class	F	F	F	F	F
Wind speed mph)	3.36	3.36	3.36	3.36	3.36
AEGL 3 Downwind Distance (yds)@PPM	194	194	323	581	166
AEGL 2 Downwind Distance (yds)@PPM	771	771	1118	1.1 mile	462
AEGL 1 Downwind Distance (yds)@PPM	1.2 miles	1.2 miles	1.7 miles	2.8 miles	1095

Table F-2 Summary of Methanol Release ALOHA Simulations						
Description	Complete release of 7,500,000 gallon	Complete release of 7,500,000 gallon	Complete release of 2,100,000 gallon	Complete release of 1,600,000 gallon	12" process pipe break release for 10 min	Tanker Truck with minimum leak
Source Type (Aloha)	Evaporating Puddle	Burning Puddle	Splashover	Burning Puddle	Evaporating puddle	Tank no fire
COMMENTS	Released inside secondary containment	Released inside secondary containment	Released inside secondary containment	Released inside secondary containment	Released inside secondary containment; 0.5 inch pipe thickness, max distance is 1 mile between isolation valves	Released inside secondary containment
Source height above ground (ft)	NA	NA	NA	NA	0	NA
Spill Volume (gallons)	NA	NA	2,100,000	NA	4,957	7,000
Source Dimensions (ft) (length x width) berm	525 X500	525 X500	NA	350 X 250	NA	NA
Source Area (Square feet) liquid puddle	262,500	262,500	337,500	87,500	80,368 sq ft x 1/4 inch deep	NA
Ground Type (wet soil, concrete, sand, etc)	Default soil	NA	Sandy soil	NA	Default	NA
Puddle Depth (inches)	NA	NA	0	NA	0	NA
Tank Dimensions or Volume	NA	NA	NA	85 X 40	NA	7,000
Valve/pipe size (inch)						1
Terrain option	Simple Terrain	Simple Terrain	Simple Terrain	Simple Terrain	Simple Terrain	Simple Terrain
Urban/rural	Urban	Urban	Urban	Urban	Urban	Urban
Cloud Cover %	0	0	0	0	0	0
Humidity %	63	63	63	63	63	63
Highest daily maximum temperatures	92	92	92	92	92	92
Stability class	F	F	F	F	F	F
Wind speed (mph)	3	3	3	3	3	3
AEGL 3 Downwind Distance (yds)@PPM	357	NA	405	NA	737	<10.9
AEGL 2 Downwind Distance (yds)@PPM	810	NA	916	NA	1,502	<10.9
AEGL 1 Downwind Distance (yds)@PPM	1.1 mile	NA	1.2 mile	NA	1.8 miles	<10.9
60 sec Fatal Fire Ball Radius (yds)	NA	142	NA	83	NA	NA
60 sec 2º Burns Radius yds)	NA	183	NA	109	NA	NA
60 sec Pain Radius yds)	NA	260	NA	157	NA	NA

Table F-3 Summary of Information Chlorine Release ALOHA Simulations			
Description	**1 ton Release from leaking valve inside controlled building (no scrubber in use during release)**	**1 ton Release from loss of fusion plug or from cylinder outside the controlled building**	**Leaking valve (1"fusion plug release) inside controlled building for 60 minutes (scrubber system in use)**
Source Type (Aloha)	**Tank**	**Tank**	**Direct from vent**
Comments			
Gas only (lbs/min)	**NA**	**NA**	**10**
Height of vent (ft)	**NA**	**NA**	**10**
Liq. Compressed Gas	**Compressed**	**Compressed**	**NA**
Tank Size or Dimensions	**1 ton**	**1 ton**	**NA**
Release Volume, lbs	**NA**	**NA**	**NA**
Tank Type	**NA**	**NA**	**NA**
Sphere	**Horizontal Cylinder**	**Horizontal Cylinder**	**NA**
Horizontal Cylinder	**NA**	**NA**	**NA**
Vertical Cylinder	**NA**	**NA**	**NA**
Piping size (inch)	**0.50**	**1.00**	**NA**
Tank Pressure (psi)	**40**	**40**	**NA**
Terrain option	**Simple Terrain**	**Simple Terrain**	**NA**
Urban/rural	**Urban**	**Urban**	**Urban**
Cloud Cover %	**0**	**0**	**0**
Humidity %	**63**	**63**	**63**
Highest daily maximum temperatures	**92**	**92**	**92**
Stability class	**F***	**F***	**F***
Wind speed (mph)	**3.36**	**3.36**	**3.36**
AEGL 3 Downwind Distance (yds)@PPM	**1470**	**1.0 miles**	**1.7 mile**
AEGL 2 Downwind Distance (yds)@PPM	**3.2**	**3.0 miles**	**>6 miles**
AEGL 1 Downwind Distance (yds)@PPM	**>6 miles**	**5.6 miles**	**>6 miles**

Table F-4 Summary of Hydrogen Sulfide Release ALOHA Simulations						
Description	Gasification: Syngas from Quench	Sour Water to WSA	Sour Water to WSA	Sour Water to WSA	AGR to WSA: Release from leaky flange	Sour Water to WSA
Source Type (Aloha)	Tank	Direct	Evaporating Puddle	Gas Pipeline	Gas Pipeline	Burning Puddle
COMMENTS	Max quantity: 148.43 lb	Max quantity 25 lb; catastrophic release of entire amount	Puddle not likely because H_2S in gas form under pressure and does not form a liquid	Leak from pipe connecting sour water stripper to WSA	Max quantity: 1467 lb	Burning puddle not likely because H_2S in gas form under pressure and does not form a liquid
Gas only (lbs/min)	NA	10	NA	NA	NA	NA
Height of Discharge (ft)	NA	20	NA	NA	NA	NA
Liq. Compressed Gas	Compressed	NA	NA	NA	NA	NA
Puddle Size (ft^2)	NA	NA	20	NA	NA	20
Puddle Volume (gal)	NA	NA	100	NA	NA	100
Tank Size (feet)	1 x5	NA	NA	NA	NA	NA
Tank Type	NA	NA	NA	NA	NA	NA
Sphere	NA	NA	NA	NA	NA	NA
Horizontal Cylinder	NA	NA	NA	NA	NA	NA
Vertical Cylinder	Vertical Cylinder	NA	NA	NA	NA	NA
Leaking Piping size (inch)	0.50	NA	NA	2.00	0.50	NA
Pipe Length (ft)	NA	NA	NA	100	330	NA
Temperature (F)	NA	NA	NA		87	NA
Tank or Pipe Pressure (psig)	NA	NA	NA	100	100	NA
Volume of Source (Lb)	149	NA	NA	Limited to pipe	1500	NA
Terrain option	Simple Terrain	Simple Terrain	Simple Tertian	Simple Terrain	Simple Terrain	Simple Terrain
Urban/rural	Urban	Urban	Urban	Urban	Urban	Urban
Cloud Cover %	0	0	0	0	0	0
Humidity %	63	63	63	63	63	63
Highest daily maximum temperatures	92	92	92	92	92	92
Stability class	F	F	F	F	F	F
Wind speed (mph)	3.36	3.36	3.36	3.36	3.36	3.36
AEGL 3 Downwind Distance (yds)@PPM	642	483	503	146	232	NA
AEGL 2 Downwind Distance (yds)@PPM	852	688	703	201	331	NA
AEGL 1 Downwind Distance (yds)@PPM	3.0 miles	3.4 miles	2.9 miles	1106	1.6 miles	NA
60 sec Fatal Fire Radius (yds)	NA	NA	NA	NA	NA	<10.9
60 sec 2º Burns Radius (yds)	NA	NA	NA	NA	NA	<10.9
60 sec Pain Radius (yds)	NA	NA	NA	NA	NA	<10.9

Table F-5 Summary of Carbon Monoxide Release ALOHA Simulations		
Description	Gasification: Syngas from	AGR to H2 & MeOH
Source Type	Gas Pipe	Gas Pipe
COMMENTS	Max quantity in process 951 lb	Max quantity in process 2954 lb
Gas only	Compressed	Compressed
Liq. Compressed Gas	NA	NA
Tank Size (inch)	NA	NA
Tank Type	NA	NA
Sphere	NA	NA
Horizontal Cylinder	NA	NA
Vertical Cylinder	NA	NA
Volume Stored (lbs)	NA	NA
Piping diameter (inch)	0.48	0.73
Pipe Length	100.00	500.00
Source Volume	951	2954
Temperature (F)	2500	110
Tank/pipe Pressure (psia)	1000	1000
Terrain option	Simple Terrain	Simple Terrain
Urban/rural	Urban	Urban
Cloud Cover %	0	0
Humidity %	63	63
Highest daily maximum temperatures	92	92
Stability class	F	F
Wind speed (mph)	3.36	3.36
AEGL 3 Downwind Distance (yds)@PPM	164	375
AEGL 2 Downwind Distance (yds)@PPM	343	945
AEGL 1 Downwind Distance (yds)@PPM	NA	NA

Table F-6 Summary of Hydrogen Release ALOHA Simulations			
Description of Container	Gasification: Syngas from Quench	Gasification: Syngas from Quench	AGR to H2 & MeOH Production
Source Type	Gas Pipe	Gas Pipe Burning	Gas Pipe
COMMENTS	Max quantity in process 266 lb	Same as gas pipe scenario except assumes that ignition occurs	Max quantity in process 437 lb
Gas only	Compressed	Compressed	Compressed
Liq. Compressed Gas	NA	NA	NA
Tank Size (inch)	NA	NA	NA
Tank Type	NA	NA	NA
Sphere	NA	NA	NA
Horizontal Cylinder	NA	NA	NA
Vertical Cylinder	NA	NA	NA
Volume Stored (lbs)	NA	NA	NA
Piping Diameter size (inch)	2.00	2.00	0.58
Pipe Length	100.00	100.00	500.00
Source Volume, lbs	Infinite	Infinite	437
Temperature	NA	NA	110
Tank Pressure (psi)	1000	1000	1000
Terrain option	Simple Terrain	Simple Terrain	Simple Terrain
Urban/rural	Urban	Urban	Urban
Cloud Cover %	0	0	0
Humidity %	63	63	63
Highest daily maximum temperatures	92	92	92
Stability class	F	F	F
Wind speed (mph)	3.36	3.36	3.36
AEGL 3 Downwind Distance (yds)@PPM	86	NA	12
AEGL 2 Downwind Distance (yds)@PPM	115	NA	16

Table F-6 Summary of Hydrogen Release ALOHA Simulations			
AEGL 1 Downwind Distance (yds)@PPM	**224**	**NA**	**29**
60 sec Fatal Fire Ball Radius (yds)	**NA**	**16**	**NA**
60 sec 2 º Burns Radius (yds)	**NA**	**23**	**NA**
60 sec Pain Radius (yds)	**NA**	**35**	**NA**

Table F-7 Summary of Sulfuric Acid Release Conditions (not modeled with ALOHA)					
Description	**Complete release of 1,900,000 gallons**	**8" process pipe break release for 10 min**	**8" process pipe (below grade) break release for 60 min**	**Tanker Truck Belly valve sheer**	**Tanker Truck with minimum leak**
Source Type	**Splashover**	**Direct no fire**	**Direct no fire**	**Tank no fire**	**Tank no fire**
COMMENTS	**Released inside secondary containment**	**Released inside secondary containment; 0.5 inch pipe thickness, max distance is 1 mile between isolation valves**	**Contents released into soil underground; 0.5 inch pipe thickness, max distance is 1 mile between isolation valves**	**Not selected for analysis; does not volatilize**	**Released inside secondary containment, does not volatilize**
Volume of Release - gal	**532,000**	**2,087**	**12,524**		

Table F-8 Summary of Propylene Release ALOHA Simulations			
Description	5,700 lb Release from one compressor pipe rupture	5,700 lb Release from one compressor pipe rupture	Release from leaky valve (1" area release)
COMMENTS	Two compressors are isolated; closed system for refrigeration of methanol	Two compressors are isolated; closed system for refrigeration of methanol	
Source Type	Gas Pipe	Gas Pipe Burning	Gas Pipe
Gas only	NA	NA	NA
Liq. Compressed Gas	Compressed	Compressed	Compressed
Tank Size or Dimensions	NA	NA	NA
Tank Type	NA	NA	NA
Sphere	NA	NA	NA
Horizontal Cylinder	NA	NA	NA
Vertical Cylinder	NA	NA	NA
Piping diameter (inch)	2.00	2.00	0.5
Pipe Length	100.00	100.00	100
Source Volume	infinite	infinite	infinite
Tank/pipe Pressure (psi)	30	30	200
Terrain option	Simple Terrain	Simple Terrain	Simple Terrain
Urban/rural	Urban	Urban	Urban
Cloud Cover %	0	0	0
Humidity %	63	63	63
Highest daily maximum temperatures	92	92	92
Stability class	F	F	F
Wind speed (mph)	3.36	3.36	3.36
AEGL 3 Downwind Distance (yds)@PPM	72	NA	34
AEGL 2 Downwind Distance (yds)@PPM	171	NA	75
AEGL 1 Downwind Distance (yds)@PPM	171	NA	75
60 sec Fatal Fire Radius (yds)	NA	11	NA
60 sec 2º Burns Radius (yds)	NA	11	NA
60 sec Pain Radius (yds)	NA	17	NA

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APPENDIX G

DENBURY LAKE CHARLES PIPELINE LATERAL
16" CO_2 PIPELINE
PUBLIC RISK AND PIPELINE DESIGN NARRATIVE

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DENBURY LAKE CHARLES PIPELINE LATERAL

16" CO_2 PIPELINE

Public Risk and Pipeline Design Narrative

DENBURY LAKE CHARLES 16" CO_2 PIPELINE LATERAL

PUBLIC RISK AND PIPELINE DESIGN

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PUBLIC RISK AND PIPELINE DESIGN

1.0 INTRODUCTION

This narrative describes aspects of the pipeline design, construction, operation, and maintenance with enhancements to minimize potential hazards to the public and to maintain system reliability. Operational procedures, design, and construction features reflecting accepted industry practices that will be used to avoid undue hazards and effects are also discussed.

2.0 PIPELINE SYSTEM DESCRIPTION

The Denbury CO2 Pipeline Lateral will consist of the following primary components: one 11.87-mile long, 16-inch diameter liquid carbon dioxide pipeline, and associated pipeline support facilities including valves for temporary pig launchers/receivers, main line isolation valves, and metering site equipment.

The transport of the CO2 originates within the Lake Charles Clean Fuels facility at a meter station to be operated and controlled by plant personnel. The inlet meter will consist of two 12" parallel orifice meter runs and automated isolation valves. The meter station will be used to measure the flow, composition, moisture content, pressure and temperature of the CO2 stream going into the pipeline from the plant compressor. This information is hard wired to a flow computer and then transmitted into the plant control system, which is monitored 24 hours per day, 7 days per week by trained operators. The measurement data will monitored by both LCCE and Denbury for purposes of pipeline leak detection and coordinated response to any upset condition that may arise.

Denbury ownership and operation of the CO2 pipeline begins downstream of the meter at a motorized 16" isolation valve with insulating flanges, which isolate the cathodic protection system within the plant from the system employed to protect the pipeline. Denbury assumes operating control at this flange, and all components and operations downstream of this point are Department of Transportation jurisdictional under 49 CFR 195. The motor operated isolation valve will be located within a fenced site at the plant north property boundary and be used to shut in the pipeline for maintenance or an emergency. Operation of the isolation valve can be accomplished both locally and remotely through the pipeline control center using satellite communication. The site also includes manually operated valves for use in maintenance activities.

Once the pipeline leaves the plant boundary, it will be routed through the adjacent industrial properties and under Bayou D'Inde Road to the north using a horizontal directional drill (HDD). The typical depth for a road crossing is at least 5 feet below the road bed and a river/stream crossing is least 20 feet below the road or stream/river bed (actual HDD depths depend on the length of the drill, maximum allowed curvature of the pipe based on diameter and wall thickness, and minimum clearance and depth required to avoid any obstructions). The pipeline will continue north to Bayou D'Inde where a 16" manually operated isolation valve will be installed within a 25 feet x 25 feet chain link fence. The valve site is equipped with smaller valves on either side of the isolation valve to allow venting of the CO2 in the event that the pipeline requires maintenance that cannot be completed with the pipeline under pressure. The pipeline will cross under Bayou D'Inde using the HDD installation method. Another pipeline isolation valve station configured as described above will be installed north of the bayou.

After crossing Bayou D'Inde, the pipeline route will progress north using conventional trenched construction methods and then cross under Interstate 10 using HDD installation method. The route continues through a mixed commercial and residential area for approximately 1 mile located between Interstate 10 and State Highway 90. The pipeline will be trenched in place and be buried with at least 3 feet of cover or 4 feet near any buildings located within 50 feet of the pipeline. The pipeline will cross under State Highway 90 using a horizontal bore. The pipeline will then parallel the Kansas City Southern (KCS) Railroad ROW and tracks for approximately 4.3 miles through a largely rural area. Additional pipeline isolation valves will be installed in this section and be located on either bank of the Sabine River Diversion Canal with plans to automate one of these valves to allow remote operation in the event of a pipeline emergency. An automated or motorized valve site foot print expands to 40 feet x 25 feet to allow installation of the valve and an accompanying building for satellite and communication controls equipment.

The route will also cross Houston River Road and the Houston River using the HDD installation method. Pipeline isolation valves will be located on either side of the river near Houston River Road and to the north at a site adjacent to the KCS railroad tracks and access road. Neither valve is planned for automation due to the close proximity to other planned automated valves at the Sabine River Diversion Canal and the pipeline end point less than 2.5 miles to the northwest.

Once the route diverts away from the KCS railroad, it will then parallel an existing power transmission corridor for approximately 1.75 miles. Construction of the pipeline in this portion of the route will include installation of an alternating current (AC) mitigation technology in the trench to protect from stray current from the power transmission lines that could impact the integrity of the steel pipe. The pipe will be buried with at least 3 feet of cover, as is expected for the majority of the pipeline route.

The route will turn westward once crossing under Bankens Road, which will be horizontally bored at a depth at least 5 feet below the road bed. The route will parallel the existing Green Pipeline and terminate inside the Lake Charles Pump Station where the custody measurement station will be installed.

The custody meter station will measure the amount of CO2 received from Leucadia prior to entering the Green Pipeline. downstream of the pumps at the station. The custody meter site will be configured similar to the plant measurement station and include an over pressure protection valve to protect the meter skid and piping. The meter skid will consist of two 12-inch senior orifice fittings, 16-inch isolation valves, motorized valve actuators with remote communication and control, pressure and temperature transmitters, a flow computer, CO2 sampling and gas chromatograph, and wiring to the pipeline control system. The data gathered by the meter station will then be transferred by satellite to the Denbury control center for monitoring and shared with the Lake Charles Clean Fuels to help facilitate effective pipeline operation and communication.

3.0 INDUSTRY RELIABILITY AND SAFETY OVERVIEW

This section provides a brief overview of the potential hazards, safety standards, and impacts on public safety associated with carbon dioxide pipelines.

3.1 Hazards

Carbon dioxide is colorless and tasteless. It is relatively odorless in low concentrations but has a musty smell in at greater concentrations. It is nontoxic, but is classified as an asphyxiant due to its displacement of oxygen in confined spaces or large concentrations. Extended exposure to

CO_2 in high concentrations can lead to the following symptoms: headache, dizziness, restlessness, breathing difficulty, sweating, malaise, increased heart rate, increased blood pressure, coma, asphyxia, and convulsions.

Unconfined mixtures of carbon dioxide in air are not explosive due to the properties of carbon dioxide. The specific gravity of gaseous carbon dioxide is 1.52 and heavier than air at atmospheric temperatures, thus potentially settling near the ground in low lying areas under colder conditions. Wind and increasing ambient temperatures will disperse carbon dioxide over time.

3.2 Pipeline Incident Data

Operating experience records for hazardous liquid and carbon dioxide pipelines have been maintained for more than 60 years. Construction, operations, and maintenance expertise have provided regulators and the industry with the opportunity to identify specific causes of pipeline failure and to address those through appropriate design, construction, operation, and maintenance practices. The primary categories of failure causes defined by the U.S. Department of Transportation (USDOT) Office of Pipeline Safety (OPS) are:

Outside force or third party damage;
Corrosion (internal and external);
Construction/material defects; and
Operator error or actions.

3.3 Impact on Public Safety

On a per mile basis, CO_2 pipelines have experienced much fewer incidents than natural gas or other hazardous liquid pipelines. Of the incidents that have occurred over the years, public impacts have been relatively minimal and include few injuries and monetary impacts due to environmental damage. Specific effects of past and potential future incidents include:

- CO_2 gas release to atmosphere only
- Exposure of the public, habitat, or species to CO_2 at varying concentrations
- Operational impacts with service deficiencies or interruption

4.0 PROJECT COMPLIANCE WITH APPLICABLE REGULATORY REQUIREMENTS

The proposed pipeline will be designed, constructed, operated, and maintained in accordance with USDOT minimum federal safety standards in 49 CFR Part 195, "Transportation of Hazardous Liquids by Pipeline". The regulations are intended to ensure adequate protection for the public from hazardous liquid and carbon dioxide pipeline failures. Part 195 specifies material selection and qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

Some key provisions of the Part 195 regulations are summarized below:

- System materials and design (49 CFR 195 Subpart C – *Design Requirements)*
- Proper construction (49 CFR 195 Subpart D – *Construction, and* Subpart E – *Pressure Testing*

- Thorough and adequate inspection, testing, maintenance and repair (49 CFR 195 Subpart F – *Operation and Maintenance*, 195.402 – *Procedural manual for operations, maintenance, and emergencies*, and 195.442 – *Damage Prevention Program*)
- Operations conducted by trained and qualified workers (49 CFR 195 Subpart G – *Qualification of Pipeline Personnel*
- Identification and mitigation of risks (195.452 - Pipeline Integrity Management)
- Coordination and preparation for emergency response (195.402 – *Procedural manual for operations, maintenance, and emergencies,* 195.403 – *Emergency Response Training*)

In addition to the provisions outlined above, many industry standards are incorporated by reference into 49 CFR Part 195, and are therefore regulatory requirements. These standards provide specifications for materials, fabrication, construction, pipe transportation, and corroded pipe analysis, which contribute to the safety of the pipeline system, and will be used in the design, operation, and maintenance of the proposed pipeline.

4.1 High Consequence Areas and Integrity Management

In accordance with the federal requirement under 49 CFR 195.452 Pipeline Integrity Management in High Consequence Areas (HCAs), Denbury will add the proposed 16-inch CO2 pipeline to its established plan titled *CO2 Integrity Management Program*. Denbury's integrity management plan meets 49 CFR 195.452 and establishes methodology for identifying HCAs, risk assessment of individual line segments, integrity assessment intervals, approved methods of assessment, criteria for prioritizing and repairing anomalies found during assessments, and documentation of all activities related to integrity management.

Part 195 has established pipeline integrity management regulations for pipelines in High Consequence Areas. High Consequence Area (HCA) means:

> (1) A commercially navigable waterway, which means a waterway where a substantial likelihood of commercial navigation exists;
>
> (2) A high population area, which means an urbanized area, as defined and delineated by the Census Bureau, that contains 50,000 or more people and has a population density of at least 1,000 people per square mile;
>
> (3) Other populated area, which means a place, as defined and delineated by the Census Bureau, that contains a concentrated population, such as and incorporated or unincorporated city, town, village, or other designated residential or commercial area;
>
> (4) An unusually sensitive area, as defined in section 195.6.

These populated and sensitive areas are published by PHMSA and used in the HCA identification process required of each natural gas and hazardous liquid pipeline operator.

4.2 Affected HCA Identification

The affected HCAs, as defined above, have been identified using data released by PHMSA and CO2 dispersion modeling to determine the extent of possible impacts due to a pipeline release. Denbury contracted with American Innovations to perform the dispersion analysis utilizing a Det Norske Veritas proprietary software called Process Hazard Analysis Software Tool (PHAST) Version 6.6. PHAST is a fully integrated software package that allows detailed hazard assessment of toxic and flammable substances.

The dispersion modeling objective is to determine the worst case dispersion distance for the anticipated maximum pipeline flow rate and pressure. This information is used in developing safety response plans and compliance with integrity management requirements.

4.2.1 Risk Analysis Assumptions

The PHAST software considered the following in determining dispersion distances from a potential release:

- Full pipeline break or guillotine rupture, which is considered a worst case release
- 16 inch pipe diameter
- 0.375 minimum pipe wall thickness
- CO2 temperature is 110F; density is 1.842 kg/m^3.
- The CO2 concentration is normalized to 100%.
- The height for concentration output is 1m (3.281 ft)
- Pipe lengths - lengths between isolation valves and quantity of material between eight (8) isolation valves
- Analysis of releases at the pipeline beginning, 25%, midpoint, 75%, and end point.
- Time to isolate flow into the pipeline and the release location is 15 minutes.
- Maximum pipeline operating pressure – 2,360 psig for a blocked discharge condition.
- Dispersion distance represents extent of 40,000 ppm concentration of CO2.
- Average meteorological conditions obtained from the National Oceanic and Atmospheric Administration (NOAA) database for the City of Lake Charles, Louisiana
    - Low temperature (41.2F) with 8.3 mph average wind speed (LTAW)
    - High temperature (91.3F) with 8.3 mph average wind speed (HTAW)

A rupture can happen at any point along the pipeline. The location of a rupture relative to the source affects the dispersion distance due to the volumes of CO2 contributed both upstream from the source and downstream of a rupture site from the pipeline itself. If a rupture is at the beginning of the pipeline then the mass available is the upstream pump rate and the inventory with the pipe from the downstream side. If the release is in the middle of the pipeline, there is an equal amount of product inventory available from the upstream and downstream ends, which may or may not result in the worst case. A pipeline rupture at the end of the pipe section has the maximum product available, but the pressure at this point will typically be lower compared to the upstream end of the pipeline. To determine which break point along the pipeline gives the worst-case scenario (maximum dispersion distance), different break point distances from the source were used in combination with other parameters.

The response time is the time to detect and isolate the pipeline when a rupture occurs. Isolation of the pipeline can be with a check valve, manually operated valve or a remotely operated valve.

When a CO2 pipeline rupture occurs, the largest dispersion distance is established within moments of initiation of the rupture when the pressure is greatest and the mass flow rate of CO2 into the rupture site is highest.

Calculated dispersion distances are applied equally to both sides of the line, assuming wind direction will push the CO2 plume to one side of the pipeline or the other and create a dispersion corridor or buffer following the centerline of the pipeline.

For CO2, 40,000 ppm (0.04 fraction) is the concentration that has been established as the Immediately Dangerous to Life and Health (IDLH) concentration for CO2 published by the National Institute for Occupational Health and Safety (NIOSH). This value was selected based on the ability for someone exposed to this concentration to: 1) Escape without loss of life or immediate or delayed irreversible health effects. (Per NIOSH, 30 minutes is considered the maximum time for escape without supplied air); and 2) prevention of severe eye or respiratory irritation or other reactions that would hinder escape.

4.2.2 Risk Analysis Results

The point release from the guillotine failure at a 50% break distance, modeled to a CO2 concentration of 40,000 ppm, had a distance higher than the other break point scenario results. This pipeline segment was then modeled at two (2) different meteorological conditions based on pipeline location to quantify the effects of wind speed on dispersion of the CO2. It was found that the high temperature with average wind speed had the largest distance to a CO2 concentration of 40,000 ppm. (Refer to Table 2 below).

The results of the analysis indicate a maximum dispersion distance of 925 feet for IDLH conditions occurs near the midpoint of the pipeline under the high temperature average wind condition (refer to Table 2 below). The minimum dispersion distance is 707 ft under low temperature average wind condition near the end point of the line. The distance of 925 feet was selected as the worst case and utilized to establish a possible exposure footprint for the entire length of the pipeline lateral and subsequently to determine the segments of the pipeline that have potential to affect HCAs.

Table 2: Meteorological Conditions - Exposure Distance

Pipeline Component	Break Point	Break Distance (feet)	HTAW (40,000 ppm Exposure Distance)	LTAW (40,000 ppm Exposure Distance)
16" Lake Charles Line	Begin	20	781	750
16" Lake Charles Line	25%	15,668	872	836
16" Lake Charles Line	50%	31,336	925	886
16" Lake Charles Line	75%	47,004	837	802
16" Lake Charles Line	End	62,673	735	707

Due to the high mass flow rate at the time of rupture, the vapor cloud travels the maximum distance within 7.3 seconds as shown in Figure 2 *CO2 Concentration vs. Maximum Plume Distance and Time.* The mass expelled from the rupture site will continue to add to the vapor cloud until the valves are completely shut, but this additional mass will not increase the vapor cloud distance due to the decreased pressure in the pipeline. Valve closure speeds and response times have little effect in reducing maximum distance; however, closure times do directly limit the duration of the public exposure and the amount of CO2 volume released to the rupture site.

Figure 1: Time vs. Mass Flow Rate and Expelled Mass

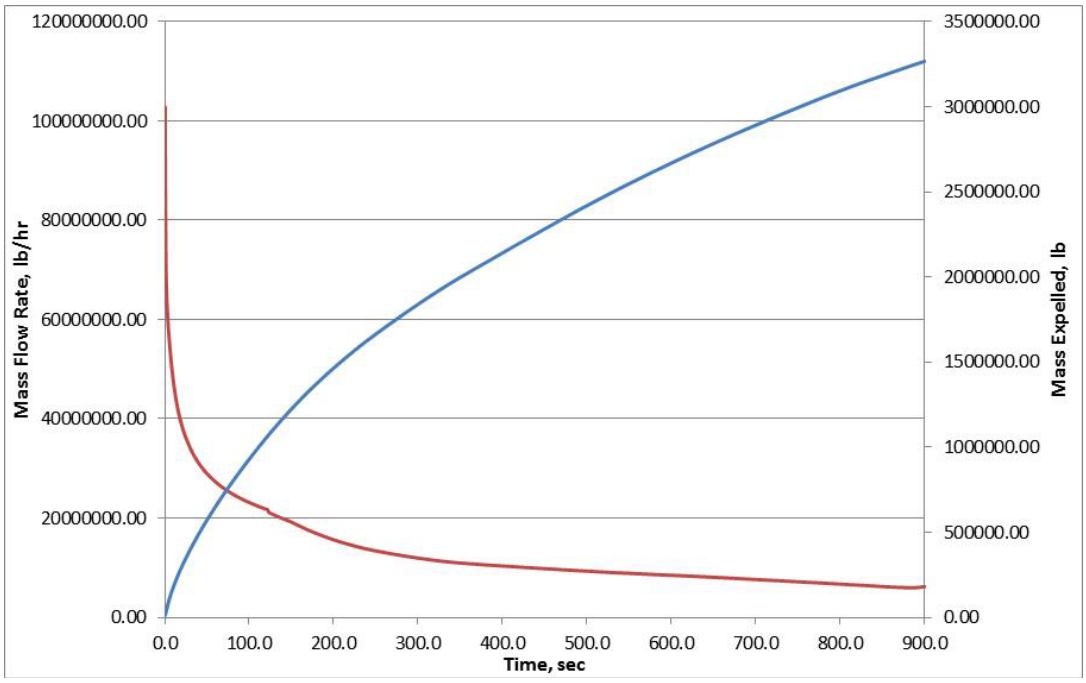
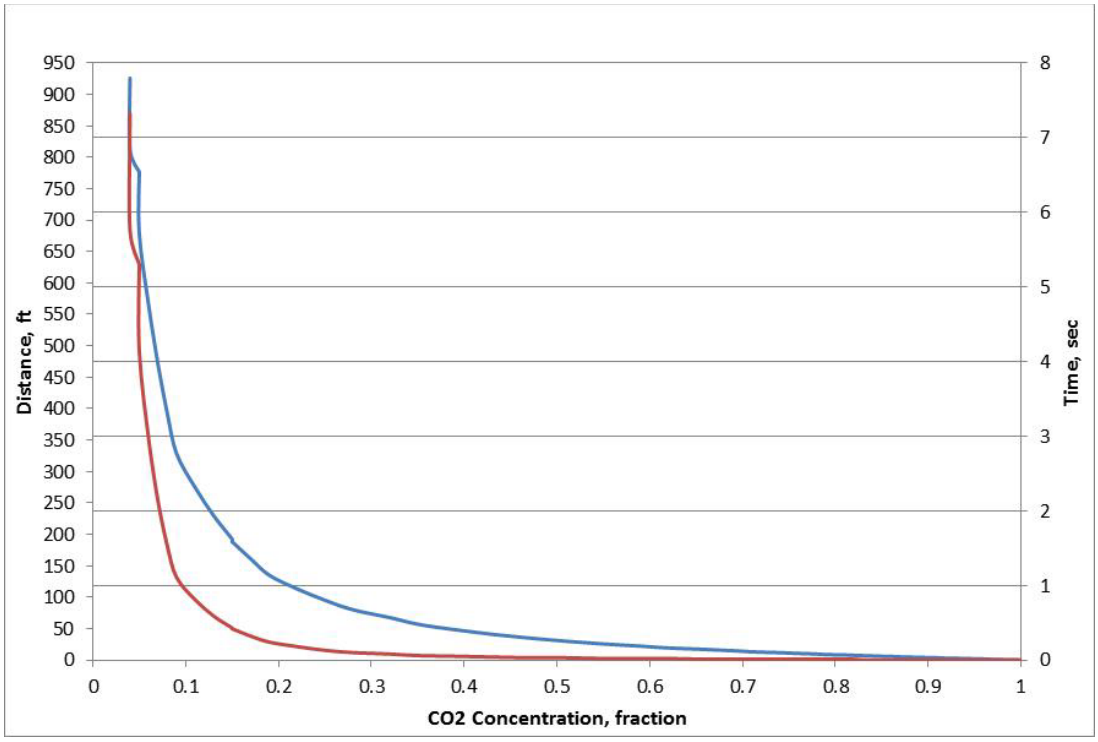


Figure 2: CO2 Concentration vs. Maximum Plume Distance and Time



4.2.3 HCA Identification

Using a 925 foot worst case dispersion corridor, the HCAs identified for the 16-inch line highly populated areas to the north and west of the pipeline near Interstate Highway 10. Approximately 2.26 miles of the route have potential to affect portions of this highly populated area. The remainder of the route is predominantly rural and not identified as an HCA by the US Department of Transportation, which consults recent census data to establish HCA footprints. A release of CO2 can affect other areas outside of officially designated HCAs, and these are identified and addressed using mitigation measures discussed below.

4.3 Risk Mitigation Measures

The design and construction of the Denbury CO2 pipeline lateral include the following elements to mitigate risks to the pipeline and surrounding HCA's.

- Selection of the pipeline route to minimize contact with HCA's where possible. Much of the route follows established utility corridors and traverses large undeveloped areas.
- Installing isolation valves on either side of navigable waterways >100ft in width. Waterways meeting this criterion along the pipeline route include Bayou D'Inde, the Houston River, and a Sabine River Diversion Canal. The longest section of pipeline between isolation valves is approximately 4 miles.
- Installing motor operators on strategic valves to facilitate remote closure and faster response time, typically 1-3 minutes after initiation of a closure command. Denbury operations personnel will also be located within approximately 15 minutes travel time to each valve on the pipeline.
- Hydrostatically pressure testing of all pipe and fittings in the pipeline to 125% of the maximum operating pressure. The predicted test pressure will be 2,950 psig based on the current pipeline design.
- Installing heavier wall thickness and abrasion-resistant coated pipe for all horizontal directionally drilled (HDD) installations. Pipe installed in HDDs will be designed with a 0.6 design factor, meaning that the maximum operating pressure of this pipe will be less than 60% of the pipe's specified minimum yield strength. The remainder of the pipeline will use a 0.72 design factor, irrespective of location designation.
- Incorporating inspection tool launchers and receivers into the design to allow for "smart pigs" to be run in the pipeline. Smart pigs traverse the entire length of the pipeline and record the condition of the pipe wall.
- Running a caliper or deformation inspection tool after all pipeline construction is complete to check for and allow for removal of any dents or out-of-round pipe.
- Selecting pipe steel with high impact properties to help resist outside force damage and high toughness to mitigate potential risk of ductile fracture of the pipe.
- Installing and maintaining pipe coatings and cathodic protection in accordance with DOT 49 CFR195 regulations. Pipe coatings will include 14-16 mils of fusion bond epoxy plus an additional 40 mils of abrasion-resistant coating like Powercrete for bored or horizontally drilled sections. Cathodic protection will include an industry-standard application of a low voltage charge to the pipeline to counter the positive ions created by the corrosion process.
- Burying all pipe with a minimum of 3 feet of cover or at least 4 feet of cover for any locations where the pipe is within 50 feet of a residence or business. There are currently less than 10 residences or businesses within 50 feet of the pipeline rights of way. The pipeline will be buried with at least 4 feet of cover adjacent to these structures.
- Establishing and maintaining liaison with appropriate fire, police, and public officials to

coordinate mutual assistance in responding to emergencies. The operator will also establish and maintain a continuing public awareness program in accordance with DOT 49 CFR 195 regulations to enable emergency response officials, the public, government officials, and those engaged in excavation activities to recognize a pipeline emergency and report it to appropriate public officials.

- Incorporating the pipeline and valves into a remote monitoring and control system.

5.0 CONSTRUCTION AND OPERATING MITIGATION MEASURES

The hazardous liquids pipeline industry, in general, has an excellent record of public safety. Pipeline system design, construction, operation, and maintenance follow strict industry practices, standards, and regulations to ensure public safety and reliability and to minimize the possibilities and effects of system failure. In the event of an incident, emergency response and contingency plans provide for a response to each of these circumstances. Prevention and mitigation measures for both the construction and operations phase of the Denbury Lake Charles lateral are discussed below.

5.1 Construction Phase

The pipeline will be constructed, operated and maintained in accordance with applicable Federal, state and local laws and regulations including but not limited to the DOT regulations in 49 CFR Part 195. In addition, construction specifications developed for installation of the pipeline will incorporate the requirements of all construction permits and Denbury engineering specifications, as well as project-specific plans and procedures for unique construction techniques.

Denbury will maintain an established safety program designed to minimize incidents and lost time injuries, and to protect the public near the Pipeline. Denbury will conduct group safety training sessions for inspection crews and construction contractor personnel before construction and each morning before construction activities begin. The construction contractor will also be required to have a safety representative onsite during construction. All personnel working on the right-of-way (ROW) during construction or operation and maintenance activities must at a minimum wear hard hats, safety glasses, and steel-toed shoes. Denbury requires that construction contractors perform all construction activities in a safe manner, including the operation of all construction equipment, all labor activities, and complying with the Occupational Safety and Health Administration's (OSHA's) excavation safety standards.

The Denbury Lake Charles lateral will be constructed of carbon steel manufactured in accordance with American Petroleum Institute (API) 5L, Grade X70, PSL 2 specifications, with an electric resistance welded (ERW) longitudinal weld seam. All pipe and appurtenances installed below grade will be coated with fusion-bonded epoxy or an equivalent protective coating, and painted with an industrial epoxy paint system for above grade installation. Buried pipeline joints will be coated with field-applied epoxy coatings. An impressed current cathodic protection system will be installed to further protect the integrity of the pipeline.

The proposed pipeline will be buried a minimum depth of 3 feet in all areas except at stream crossings where the burial depth will be at least 5 feet or greater under the stream/canal/river bottom (specific permit requirements will dictate exact burial depth for some crossings). Warning signs will be placed at road crossings and at other strategic spots along the pipeline route that will include identification and ownership information, including emergency contact telephone numbers.

The end point inspection tool launcher/receiver traps and intermediate valve stations will be located within security-fenced areas to prevent unauthorized access to the facilities. Buildings will be made of non-combustible materials. Electrical equipment and wiring will be installed in conformance with applicable sections of the National Electric Code, National Fire Protection Association (NFPA)-70.

The pipeline will be hydrostatically tested to prove its structural integrity before CO2 is introduced into the line and it commences operation. Testing will be performed and documented in accordance with 49 CFR Part 195.

Denbury will take further safety precautions regarding foreign utility lines that may be crossed during construction. Denbury will send letters to the owners of all known, reported, or otherwise documented lines within the proposed work areas along with drawings showing the location of the owners' respective lines. In the letters, Denbury will request a written response to the following inquiries:

- Size, type, and pressure
- Verification of the location and depth of cover
- ROW width
- Information concerning other pipelines immediately adjacent to or intersecting the new pipeline that were identified
- Special construction requirements
- Names, addresses, telephone numbers, and lead time of personnel to contact before construction begins

During construction, the contractor will complete the One Call notification to allow operators of foreign pipelines and utilities to probe and mark each line. Each foreign utility line will be carefully exposed before trenching.

Before construction, Denbury will notify all appropriate local officials and agencies concerning the schedule of upcoming construction activities. Where necessary, arrangements for detours and warning signs will be made for roads that will be impacted.

5.2 Operations Phase

Denbury maintains an operations and maintenance manual containing written procedures for normal operations and maintenance and abnormal operations and emergencies in accordance with DOT 49 CFR 195 regulations. This manual includes requirements for preventive maintenance and patrols of facilities, as well as procedures to be followed in the event of an accident or natural catastrophe. This manual is made available to all affected operations personnel.

Periodic training sessions and review of operating procedures and emergency procedures will be conducted for affected operations employees. This training will include the safe operation of all pipeline system equipment, hazardous material handling procedures, public liaison programs, emergency response actions and coordination, and general operating procedures.

Measures will be implemented to protect the public and exclude unauthorized persons from hazardous areas along the pipeline. All above ground facilities including block valves, scraper traps and delivery points will have perimeter chain link fencing with multiple-strand barbed wire

at the top. Valves and access gates will be locked at unmanned locations. Signage at facilities will include statements such as “Authorized Personnel Only”. On the right-of-way, pipeline warning signs complying with DOT regulations will be placed at all road, railroad and waterway crossings and at other locations of public access. Besides warning of the pipeline’s location, the signs will direct the public to call the Operations Control Center and the local one-call notification center at least 48 hours before commencing any excavation near the pipeline. Additionally, aerial patrols will give immediate phone notification to dispatch operations personnel of any apparent activity by the public near the pipeline that could be an endangerment to people and the pipeline.

Standard procedures will be implemented for temporary marking of the pipeline for third party contractors and utilities, and for obtaining adequate marking and location information of foreign lines and utilities prior to commencing maintenance work. Standard procedures will be implemented for maintenance activities such as lock-out / tag-out procedures, checking for low-oxygen atmospheres when the pipeline is opened, procedures for excavating pipelines and utilities, traffic control, and procedures that will ensure compliance with pertinent OSHA regulations.

5.3 Right-of-Way Inspections

Regularly scheduled aerial patrols of all Lake Charles lateral facilities will be performed along with scheduled preventive maintenance. Periodic vehicle patrol will also be used. Any unusual situation or condition will be reported and investigated immediately.

Denbury is also a member of the local Louisiana “One Call” System pre-excavation notification organization. Through this system, contractors provide notification to a central agency of proposed excavations, which in turn notifies the operator of the excavation locations. If facilities are located in the area of proposed contractor activity, they will be marked in the field, and a representative of the operator will be present during excavation to ensure that the facility is not compromised.

5.4 Monitoring and Control

An operations control center will monitor system pressures, flows, and customer deliveries. Further, the control center is manned 24 hours per day, 365 days per year. The operator will have remote operation control of specific mainline valves.

A Supervisory Control and Data Acquisition (SCADA) system, in the operations control center, will provide for pipeline control and monitoring at all times. Remote Terminal Units (RTU’s) for the SCADA system will be present at the end point stations and specific block valves along the system. If system pressures fall outside a predetermined range, an alarm will be activated and notice will be transmitted to the operations control center. The alarm will include notice if pressures at a station are not within an acceptable range. The operator will take corrective action and/or dispatch personnel to investigate the situation. Denbury personnel will provide quick response to emergencies and direct safety operations as necessary.

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APPENDIX H

PUBLIC MEETING AND COMMENT PERIOD REPORT

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ATTACHMENTS

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2 PUBLIC MEETING MATERIALS
3 SIGN IN SHEETS
4 DOE PRESENTATION
5 PUBLIC MEETING TRANSCRIPTS AND WRITTEN COMMENTS RECEIVED
6 COMMENTS AND RESPONSES

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INTRODUCTION

The U.S. Department of Energy (DOE) announced the availability of the Lake Charles Carbon Capture and Sequestration project (Lake Charles CCS project) Draft Environmental Impact Statement (EIS) in a Notice of Availability (NOA) published in the *Federal Register* (FR) by the U.S. Environmental Protection Agency (EPA) on May 10, 2013 (78 FR 27374). DOE distributed the Draft EIS to the elected officials, agencies, Native American tribes, organizations, and members of the public identified in the distribution list in Chapter 9 of the Draft EIS. The NOA indicated that comments on the Draft EIS had to be submitted within a 45-day comment period, which ended on June 25, 2013. On May 14, 2013, DOE published its own NOA of the Draft EIS (78 Federal Register 28205) and announced its plans to hold two public hearings, one in Westlake, Calcasieu Parish, Louisiana, and one in Pearland, Brazoria County, Texas.

PUBLIC HEARING

Public hearings were held in two locations to provide the public an opportunity to comment on the Draft EIS for the proposed project. The first hearing was held on June 4, 2013, at the Westlake City Hall in Westlake, Calcasieu Parish, Louisiana, and the second hearing was held on June 5, 2013, at Berry Miller Jr. High School in Pearland, Brazoria County, Texas. In addition to the NOA published in the Federal Register, DOE published advertisements in five local newspapers on May 20, 2013, as shown in Table H-1, to advertise the public hearing and solicit public comments. Attachment 1 contains copies of the newspaper notices and the affidavits of publication.

Table H-1 Dates and Publications for Advertisement

Newspaper	Date of Publication
Houston Chronicle	May 20, 2013
Beaumont Enterprise	
Galveston Daily News	
Lake Charles American Press	
Lafayette Daily Advertiser	

Information about the NEPA process and the project was provided on tabletop poster displays at each public hearing. Attachment 2 provides copies of the information provided during the hearings. The tabletop display posters described:

- the proposed action, connected action, DOE funding, alternatives considered, the no action alternative, and the scope of the analysis;
- steps on how to comment on the Draft EIS;
- an explanation of the NEPA process;
- the carbon capture and sequestration process; and
- the overview of key environmental impacts.

The following fact sheets were made available for meeting attendees:

- Welcome fact sheet (including meeting format and comment process);
- Carbon dioxide fact sheet;
- DOE National Environmental Policy Act (NEPA) fact sheet; and
- Carbon capture and sequestration process fact sheet.

Attendees were requested to sign in and were provided comment cards. Collectively, 27 members of the public attended the public hearings in the two locations. Appendix 3 provides the lists of attendees. Both hearings began with an informal open house from 5 p.m. to 7 p.m. During this time, attendees were given the opportunity to review fact sheets about the project and were able to view project-related exhibits. DOE, its support staff, and Leucadia Energy, LLC (Leucadia) personnel were available at the exhibits illustrating various features of the proposed project.

DOE personnel and support staff were on hand to greet attendees, outline the meeting agenda, and answer questions about the Draft EIS, the NEPA process, and the project status. DOE personnel also invited all attendees to provide comments, either written or verbal, on the Draft EIS. Those attendees wishing to provide oral comments were given an opportunity to sign up to do so at the sign-in table. Comment sheets were made available for all attendees to provide written comments, either at the hearing or via facsimile or mail after the hearing. An email address, a postal address, a fax number, and a toll-free telephone number were provided. In addition, individuals could request a copy of the Final EIS in various format options.

The open house was followed by a formal presentation at 7:00 p.m. given by DOE and Leucadia representatives. The representatives explained the Lake Charles CCS project, DOE's role in the project, the NEPA process, and the ways in which the public could submit comments on the Draft EIS. Attachment 4 provides a copy of the presentation, and the information provided is summarized below.

Mr. George O'Neil, the DOE's project manager for the proposed project, welcomed the attendees and introduced the meeting participants. He explained that his role in the project was to ensure that public interests were represented and the congressional mandate was followed. Mr. O'Neil then explained the legislative history of the funding opportunity DOE was providing for the project. He also explained why the Lake Charles CCS Project was chosen for a cost-sharing collaboration project and provided a percentage cost-share breakdown of the project costs between DOE and Leucadia.

Mr. Don Maley gave a quick overview of the Lake Charles CCS Project. He described the scope of the proposed project and connected action, including construction of a CO_2 pipeline and the monitoring, verification, and accounting (MVA) process. Mr. Maley explained how the CO_2 will be captured; the cleaning, compression, and transportation of the gas; and its subsequent use

to support ongoing enhanced oil recovery operations. He also identified the locations of specific project components.

Ms. Pierina Fayish explained the NEPA review process, including: the publishing of the Notice of Intent, public scoping meetings, environmental analyses, the Draft EIS, and the project schedule through the end of 2013. She also explained the process for submitting comments on the Draft EIS.

After the formal presentation, the public was invited to give verbal comments at the microphone. A court reporter was present at the meeting to document the verbal comments for the project record. Transcripts of the formal portions of the hearings are provided in Attachment 5. The formal hearings adjourned at approximately 8:00 p.m. on June 4, 2013, and at 7:30 p.m. on June 5, 2013.

No oral or written comments were received at the June 5, 2013, public hearing in Pearland, Texas. All oral and written comments received at the June 4, 2013, public hearing in Westlake, Louisiana, and all emailed, faxed, and mailed comments are included in Attachment 5.

METHODOLOGY

In preparing the Final EIS, DOE considered all comments received on the Draft EIS, both individually and collectively. An identification (ID) number was assigned to each originator of comments (i.e., per commenter), including the individual who spoke at the public hearing. Each specific comment by the same commenter was assigned a sequential comment letter (e.g., 1-1, 1-2, etc.). A total of 18 individuals and agencies provided comments on the Draft EIS with one commenter providing a supplemental comment, as follows:

Commenter Name	Representing	ID No.
Mayor Randy Roach	Public	1
Charlie Atherton	Public	2
John Paul Williams	Public	3
Jordan Macha	Public	4
Michael Dees	Public	5
Ann Barilleaux	Public	6
Hal McMillin	Public	7
Casey Roberts	Sierra Club	8
Martin S. Mayer	U.S. Army Corps of Engineers	9
Edith Erfling	U.S. Fish and Wildlife Service	10
Kyle F. Balkum	Louisiana Department of Wildlife and Fisheries	11
Salvador Salinas	U.S. Natural Resources Conservation Service	12
Rhonda Smith	U.S. Environmental Protection Agency	13
Stephen R. Spencer	U.S. Department of the Interior	14
Beth Altazan-Dixon	Louisiana Department of Environmental Quality	15
Noel Ardoin	Louisiana Department of Transportation and Development	16
Jean Public	Public	17
John Paul Williams	Gulf Coast Labor and Environmental Coalition	18
Casey Roberts	Sierra Club – Supplemental Comment	19

Each comment is provided in its original form (annotated by its ID number) in Attachment 5. Attachment 6 contains the comments that correspond to the numbering system, as well as the DOE and Leucadia responses. DOE prepared responses to the comments and revised the Draft EIS, as appropriate. Most revisions were based on events that took place or information obtained in the time between the preparation of the Draft EIS and the preparation of the Final EIS. The Draft EIS was also revised based on changes in Leucadia's plans for the location of the construction laydown area and the methanol and sulfuric acid storage area and DOE's internal technical and editorial review.

Attachment 1

Public Meeting Notification Materials

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United States Department of Energy
Draft Environmental Impact Statement Public Hearings
Lake Charles CCS Project

The U.S. Department of Energy (DOE) will conduct two Draft Environmental Impact Statement (DEIS) public hearings to obtain public comments on the DEIS for its proposed action of providing financial assistance for the construction and operation of a project proposed by Leucadia Energy, LLC (Leucadia). DOE selected this project for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Storage (ICCS) Program. The Lake Charles Carbon Capture and Sequestration Project (Lake Charles CCS Project) would demonstrate advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification plant (LCCE Gasification plant) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the West Hastings oil field, south of Houston, Texas. The Lake Charles CCS project would be designed to capture and sequester approximately 4.6 million tons of CO_2 per year that the facility would otherwise emit. The West Hastings research MVA program is aimed at providing an accurate accounting of approximately 1 million tons of stored CO_2 and a high level of confidence that the CO_2 will remain sequestered permanently in historic oil-producing geologic formations located approximately 6,500 feet below the land surface.

Members of the public are invited to attend one of the scheduled public hearings to obtain information about the proposed project and make comments on the DEIS. DOE and project personnel will be available for an informal open house from 5:00pm to 7:00pm, followed by a project presentation and oral comments from 7:00pm to 9:00pm.

Date: **Tuesday, June 4, 2013**,
Informal Open House: **5:00 pm**
Formal Meeting: 7:00 pm
Place: Westlake City Hall
10001 Mulberry Street
Westlake, LA 70669

Date: **Wednesday, June 5, 2013**
Informal Open House: **5:00 pm**
Formal Meeting: 7:00 pm
Place: Berry Miller Jr. High School
3301 Manvel Road
Pearland, TX 77584

Individuals wishing to speak at the formal meeting may either register in advance by notifying DOE as indicated below, or register at the meeting. DOE encourages public participation in the NEPA process. Comments postmarked by June 24, 2013, will be addressed in the Final EIS, which will be used by DOE in its decision making process for the proposed action. For further information about this project, or to register in advance, contact:

Ms. Pierina Fayish
U.S. Department of Energy
National Energy Technology Laboratory

P.O. Box 10940
Pittsburgh, PA, 15236
Phone: (412) 386-5428, or (888) 322-7436
Fax: (412-386-4604)
email: LeucadiaEIS@NETL.DOE.GOV

AFFIDAVIT OF PUBLICATION

STATE OF TEXAS:

COUNTY OF HARRIS:

Before me, the undersigned authority, a Notary Public in and for the State of Texas, on this day personally appeared, the Newspaper Representative at the HOUSTON CHRONICLE, a daily newspaper published in Harris County, Texas, and generally circulated in the Counties of: HARRIS, TRINITY, WALKER, GRIMES, POLK, SAN JACINTO, WASHINGTON, MONTGOMERY, LIBERTY, AUSTIN, WALLER, CHAMBERS, COLORADO, BRAZORIA, FORT BEND, GALVESTON, WHARTON, JACKSON, and MATAGORDA and that the publication, of which the annexed herein, or attached to, is a true and correct copy, was published to-wit:

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Edward Silva
NEWSPAPER REPRESENTATIVE

Sworn and subscribed to before me, this the 20th Day of May A.D. 2013

VERONICA M TYRONE NOTARY PUBLIC STATE OF TEXAS EXPIRES FEB. 10, 2016

Veronica M Tyrone
Notary Public in and for the State of Texas

United States Department of Energy Draft Environmental Impact Statement Public Hearings Lake Charles CCS Project

The U.S. Department of Energy (DOE) will conduct two Draft Environmental Impact Statement (DEIS) public hearings to obtain public comments on the DEIS for its proposed action of providing financial assistance for the construction and operation of a project proposed by Leucadia Energy, LLC (Leucadia). DOE selected this project for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Storage (ICCS) Program. The Lake Charles Carbon Capture and Sequestration Project (Lake Charles CCS Project) would demonstrate advanced technologies that capture carbon dioxide (CO_2) emissions at the Lake Charles Clean Energy Gasification plant (LCCE Gasification plant) to be located on the west bank of the Calcasieu River in southern Calcasieu Parish, Louisiana; and permanent storage of a portion of the CO_2 injected as part of existing enhanced oil recovery (EOR) operations in the West Hastings oil field, south of Houston, Texas. The Lake Charles CCS project would be designed to capture and sequester approximately 4.6 million tons of CO_2 per year that the facility would otherwise emit. The West Hastings research MVA program is aimed at providing an accurate accounting of approximately 1 million tons of stored CO_2 and a high level of confidence that the CO_2 will remain sequestered permanently in historic oil-producing geologic formations located approximately 6,500 feet below the land surface.

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Ms. Pierina Fayish
U.S. Department
of Energy
National Energy
Technology Laboratory
P.O. Box 10940
Pittsburgh, PA, 15236
Phone: (412) 386-5428,
or (888) 322-7436
Fax: (412-386-4604)
email: LeucadiaEIS@
NETL.DOE.GOV

Publishers Affidavit

Acct #039844103 Job =193881801 *Tear Sheet Attached*
Name ECOLOGY AND ENVIRONMENT, INC 3915317 *B24243957*

STATE OF TEXAS
COUNTY OF JEFFERSON

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED Monica Mendoza

WHO BEING BY ME DULY SWORN, DEPOSES AND SAYS THAT HE/SHE IS A NEWSPAPER REPRESENTATIVE FOR THE BEAUMONT ENTERPRISE; THAT SAID NEWSPAPER REGULARLY PUBLISHED IN JEFFERSON COUNTY CIRCULATED IN JEFFERSON, HARDIN, TYLER, NEWTON, ORANGE, JASPER, LIBERTY, SABINE, CHAMBERS, SAN AUGUSTINE, ANGELINA AND GALVESTON COUNTY(COUNTIES), TEXAS; THAT THE ATTACHED NOTICE IN SAID NEWSPAPER ON THE FOLLOWING DATE(S), TO WIT:

05-20-13

Monica Mendoza
NEWSPAPER REPRESENTATIVE

SWORN AND SUBSCRIBED TO BEFORE ME, THIS 21ST DAY OF MAY 2013,

TO CERTIFY WHICH WITNESS MY HAND AND SEAL OF OFFICE.

Elizabeth Ann Gonzales
NOTARY PUBLIC IN AND FOR
THE STATE OF TEXAS

NOTARY PUBLIC STATE OF TEXAS
ELIZABETH ANN GONZALES
NOTARY PUBLIC, STATE OF TEXAS
MY COMMISSION EXPIRES
APRIL 3, 2016

ELIZABETH Ann Gonzales
PRINT OR TYPE NAME OF NOTARY PUBLIC
MY COMMISSION EXPIRES 4/3/16

Bruins top Rangers 5-2

Claude Julien wanted his Bruins to play more aggressively in the third period. The Boston coach got his wish with the help of some shaky defense by the New York Rangers.

A rare rough day for goalie Henrik Lundqvist certainly helped, too.

Brad Marchand and Milan Lucic scored in the final period after Johnny Boychuk broke a tie in the second, Lundqvist gave up more than four goals for the first time in 152 games, and Boston beat New York 5-2 on Sunday to take a 2-0 lead in the Eastern Conference semifinal series.

New York's best period was the second when it outshot Boston 16-9. The Rangers then allowed two goals in the third.

Games 3 and 4 in the best-of-seven series will be played in New York on Tuesday and Thursday nights.

The Rangers played their best period of the series in the second, but Brad Marchand gave Boston a 4-2 lead just 26 seconds into the third.

The Associated Press

Perkins thinks he'll be back in OKC

Ozen graduate Kendrick Perkins has dodged one bullet in regards to his future with the Oklahoma City Thunder.

Perkins' future with the team came into question following the Thunder's elimination from the NBA playoffs.

However, Saturday, Thunder General Manager Sam Presti announced that Perkins would not be waived using the NBA's amnesty clause.

"We think Perk has a lot of value to our team," Presti said. "He's a member of a team that won 60 games and helped us to our third division title in three years. I don't know that we can discount that. I'm sure he'd like to have had a better postseason. But I'm sure that's pretty universal for the whole group. And we accept that."

In the playoffs Perkins averaged 2.2 points and 3.7 rebounds per game.

As part of the league's new collective bargaining agreement, the amnesty clause gives teams a chance to waive a player who was signed before July 1, 2011. In turn, the waived player is still paid his salary, but his contract would not count against the team's salary cap.

"At the end of the day, I'm pretty comfortable and I'm pretty sure that I'll be back here next year," Perkins told reporters. "So I'm not worried about that."

Man hits hole-in-1

The hole-in-one club keeps getting larger during the 2013 year as Charley Leatherwood hit one using a seven wood on the 145-yard No. 6 hole at Tyrrell Park's Henry Homberg golf course Thursday.

His brother, James Leatherwood, was a witness.

Avi Zaleon

SPURS: Largest first-half playoff deficit for Memphis

Continued from page 1B

within 62-56 with 3:43 left in the third quarter.

The comeback was short-lived, though.

Bayless missed a 3-pointer on the next trip, and Manu Ginobili was able to make one at the opposite end to spark an 11-1 response that immediately restored the Spurs' lead to 16 by end of the quarter. Leonard hit a pair of 3-pointers and Gary Neal had one as San Antonio kept pouring it on in the fourth.

The four regular-season meetings were all won by the team with more points in the paint, but perimeter shooting proved to be a bigger factor in the playoff opener. Memphis, which was second in the NBA by holding opponents to 33.8 shooting on 3-pointers, let San Antonio make 13 of its first 24 from behind the arc and finish 14 of 29.

Danny Green connected three times and scored 16, and Matt Bonner hit four of his five attempts for 12 points.

"We did a good job of moving the basketball, finding each other, trusting each other," Green said. "Luckily we made some today."

Pondexter led Memphis with 17 points, Marc Gasol scored 15 and Mike Conley had 14 points and eight assists.

"We were just so hyper, just running all over the place on defense," Hollins said. "We'd have four guys in the paint and nobody would be out on the perimeter guarding anybody. And that's not how we play defense."

The Spurs asserted themselves early, scoring on their first seven possessions and also getting a couple head-to-head defensive stops from their veterans while claiming a quick 23-8 lead. Parker swiped the ball from Conley on Memphis' second possession, running out for a layup, and Hollins burned a timeout in the first 2 minutes.

Tim Duncan snuffed out the ensuing play by blocking Randolph's shot, and the Spurs' strong start continued. Bonner hit back-to-back 3-pointers for a 17-point edge late in the first quarter, and San Antonio pushed out to a 43-23 advantage following consecutive baskets by Parker with 6:06 left before halftime.

It was the largest first-half deficit for the Grizzlies during the playoffs.

"Every time we made a mistake defensively, they made us pay every time," Gasol said, who had three baskets in a push that helped Memphis get within 51-37 at halftime. "It was over-help or no help or whatever it was, they made you pay."

Notes: Memphis' only other deficit larger than 20 this postseason came in the first-round opener against the Los Angeles Clippers. L.A. didn't lead by 20 until the final minute of a 112-91 victory. ... Tracy McGrady got a standing ovation when he checked in with the Spurs up by 20 midway through the fourth quarter. ... The Spurs had 13 3-pointers in Game 1 of their second-round series against the Clippers in last year's playoffs.

NBA playoffs

(Best-of-7)

CONFERENCE FINALS

Sunday

San Antonio 105 Memphis 83, San Antonio leads series 1-0

Tuesday

Memphis at San Antonio 8

Wednesday

Indiana at Miami 7:30

Friday

Indiana at Miami 7:30

Saturday

San Antonio at Memphis 8

Sunday May 26

Miami at Indiana 7:30

Monday May 27

San Antonio at Memphis 8

Tuesday May 28

Miami at Indiana 7:30

Wednesday May 29

x-Memphis at San Antonio, 8

Thursday May 30

x-Indiana at Miami, 7:30

Friday May 31

x-San Antonio at Memphis, 8

Saturday June 1

x-Miami at Indiana, 7:30

Sunday June 2

x-Memphis at San Antonio, 8

Monday June 3

x-Indiana at Miami, 7:30

Young Americans waste no time qualifying for Indy

By The Associated Press

Bump Day at Indianapolis followed the script.

No surprises, no drama and no drivers getting bumped.

On a day devoid of tension and rumors, all nine drivers who made attempts on the second and final day of Indianapolis 500 qualifications made it into the 33-car field, led by two young Americans — Josef Newgarden and Graham Rahal — who easily had the two fastest cars on the track.

"I don't want to sound too confident, but I knew we would be fine," Newgarden said after delivering the day's best qualifying run at 225.731 mph. "I think we would have been OK yesterday if we would have had another shot at it."

The lone twist might have come if Mexico's Michel Jourdain Jr. actually made a qualifying attempt to get in the race. But after failing to top 220 mph in practice, the discouraged Jourdain had his car towed back to Gasoline Alley.

That left it up to Newgarden, the Tennessee native, and Rahal, the son of a former 500 winner, to captivate the fans.

Newgarden's chance came after he failed to get a second shot to make it in Saturday when he sitting in qualifying line as the gun sounded at 6 p.m. He had to wait another 18 hours and this time, he left no doubt that he belonged. His qualifying speed from Sunday would have been good enough for 21st, the outside of Row 7, if it happened a day earlier. Instead, he'll start 25th, the inside of Row 9.

Rahal struggled all week — and not just because he was using a Honda engine. The nine drivers in the first three rows of the three-car, 11-row grid are all powered by Chevrolets. The top Honda qualifier was Canadian Alex Tagliani, the 2011 Indy pole-sitter. He'll start 11th, the middle of Row 4, after going 227.386.

Rahal, who drives for his father, Bobby, couldn't quite get his car right. But when it mattered Sunday, Rahal easily made it in with an average speed of 225.007 to claim the No. 26 starting spot — the middle of Row 9.

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Legal Notices

United States Department of Energy Draft Environmental Impact Statement Public Hearings Lake Charles CCS Project

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Date: Wednesday, June 5, 2013 Informal Open House: 5:00 pm Formal Meeting: 7:00 pm Place: Barry Miller Jr. High School 2601 Manvel Road Pearland, TX 77584

Individuals wishing to speak at the formal meeting may either register in advance by notifying DOE as indicated below, or register at the meeting.

Legal Notices

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Ms. Pierina Fayish U.S. Department of Energy National Energy Technology Laboratory

P.O. Box 10940 Pittsburgh, PA. 15236 Phone: (412) 386-5428, or (888) 322-7436 Fax: (412-386-4604) email: LeucadiaEIS@NETL.DOE.GOV

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Time Warner Cable's agreements with programmers to carry their services routinely expire from time to time. We are usually able to obtain renewals or extensions of such agreements, and carriage of programming services is discontinued only in rare circumstances. The following agreements with programmers are due to expire soon, and we may be required to cease carriage of one or more of these services in the near future.

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GolTV HD
IFC
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Lifetime
Lifetime HD
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NHL Center Ice HD
NHL Network
NHL Network HD
Showtime E
Showtime E HD
Showtime 2 E
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Showtime Extreme E
Showtime Extreme HD E
Showtime Beyond E
Showtime Next E
Showtime Women E
Showtime Family Zone E
Showtime W
Showtime HD W
Showtime 2 W
Showtime Showcase W
Showtime Extreme W
Showtime Beyond W
Showtime Next W
Showtime Women W
Showtime Family Zone W
Showtime On Demand
Smithsonian HD
Starz
Starz HD
Starz Cinema
Starz Edge
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Starz Kids & Family
Starz Kids & Family HD
Starz On Demand
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The Movie Channel Xtra E
The Movie Channel Xtra HD E
The Movie Channel W
The Movie Channel Xtra W
The Movie Channel On Demand
WE tv
WE tv HD

In addition, from time to time we make certain changes in the services that we offer in order to better serve our customers. The following changes are planned:

ADD:
Disney On Demand to SVOD Channel 805
Too Much For TV to SVOD Channel 855

MOVE:
None at this time

DELETE:
Time Warner Cable may cease carriage of NuvoTV or reposition NuvoTV to the Max Canales Tier of service
Time Warner Cable may cease carriage of CBS Sports Network

CHANGE:
G4 on Digital Cable Channel 451 and HD Channel 1451 will rebrand to Esquire Network

The new services listed below cannot be accessed on CableCARD-equipped Unidirectional Digital Cable Products purchased at retail without additional, two-way capable equipment. HD television and HD set-top box required to receive HD services.

None at this time

*HD Television and HD set-top box required to receive HD service

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A F F I D A V I T

Attachment

006 Legal Notices

United States Department of Energy
Draft Environmental Impact Statement
Public Hearings
Lake Charles CCS Project

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Pearland, TX 77584

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Ms. Pierina Fayish
U.S. Department of Energy
National Energy Technology Laboratory
P.O. Box 10940
Pittsburgh, PA 15236
Phone: (412) 386-5428, or (888) 322-7436
Fax: (412-386-4604)
email: LeucadiaEIS@NETL.DOE.GOV

Published: May 20, 2013
00330901

f Galveston §
§
Texas §

e, the undersigned authority, on this day personally came and **Sandra Villamil**, to me well known (or proved to me on the atisfactory evidence), and who after being duly sworn (affirmed) e and say that she is an **AGENT** for **THE GALVESTON Y DAILY NEWS**, a newspaper of general circulation, which has inuously and regularly published for a period of not less than one he County of Galveston, and that the **NOTICE**, a copy of which attached was published in said newspaper on the following days,

May 20, 2013

Sandra Villamil
Agent Signature

d subscribed before me

he 20th day of May, 2013

Lynette Tisdale
or the State of Texas

LYNETTE TISDALE
Notary Public, State of Texas
My Commission Expires
2-11-2016

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Lily Hassan
Houston Office
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I, Rose Penfold, do solemnly swear that I am the LEGAL CLERK of THE ADVERTISER, a newspaper printed and published at Lafayette, in the Parish of Lafayette, State of Louisiana, and that from my personal knowledge and reference to the files of said publication, the advertisement of

United States Department of Energy
Draft Environmental Impact Statement Public Hearings
Lake Charles CCS Project

was published in THE ADVERTISER on the following dates:

*Sunday, May 19, 2013

Rose Penfold

ROSE PENFOLD
LEGAL CLERK

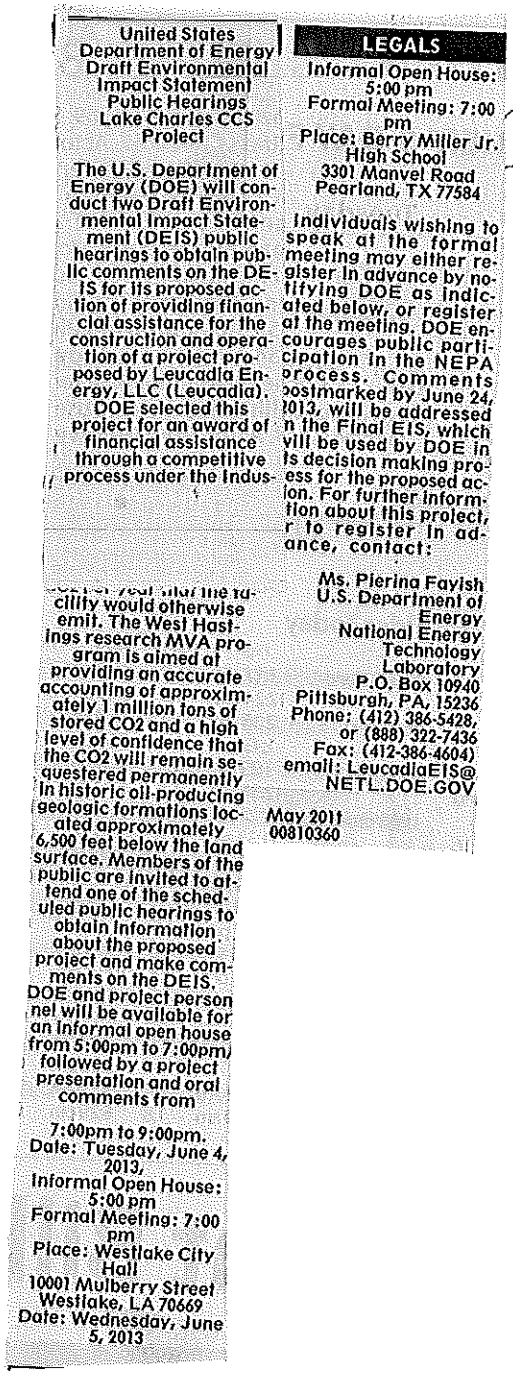
Sworn to and subscribed before me this 20th day of May, 2013.

Rhonda W Colson

Notary Public - Rhonda W. Colson ID# 067990

Affidavit of Publication

STATE OF LOUISIANA
Parish of Calcasieu



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LEGALS

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Ms. Pierina Fayish
U.S. Department of Energy
National Energy Technology Laboratory
P.O. Box 10940
Pittsburgh, PA, 15236
Phone: (412) 386-5428, or (888) 322-7436
Fax: (412-386-4604)
email: LeucadiaEIS@NETL.DOE.GOV

May 2011
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[illegible] that the facility would otherwise emit. The West Hastings research MVA program is aimed at providing an accurate accounting of approximately 1 million tons of stored CO2 and a high level of confidence that the CO2 will remain sequestered permanently in historic oil-producing geologic formations located approximately 6,500 feet below the land surface. Members of the public are invited to attend one of the scheduled public hearings to obtain information about the proposed project and make comments on the DEIS. DOE and project personnel will be available for an informal open house from 5:00pm to 7:00pm, followed by a project presentation and oral comments from

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Westlake, LA 70669
Date: Wednesday, June 5, 2013

Before me the undersigned authority, personally came and appeared Karen Dollins who being duly sworn, deposes and says:

He/She is a duly authorized agent of
LAKE CHARLES AMERICAN PRESS
a newspaper published daily at 4900 Highway 90 East, Lake Charles, Louisiana, 70615. (Mail address: P.O. Box 2893 Lake Charles, LA 70602)

The attached Notice was published in said newspaper in its issue(s) dated:

00810360 - $45.00
May 20, 2013

Karen Dollins
Duly Authorized Agent

Subscribed and sworn to before me on this 20th day of May, 2013 at Lake Charles, LA

Barbara Burgess #027065
00093629 Notary Public

Ecology and Enviroment, Inc

Publishers Affidavit

Acct #039844103 Job =193881801 *Tear Sheet Attached*
Name ECOLOGY AND ENVIRONMENT, INC 3915317 *B24243957*

STATE OF TEXAS
COUNTY OF JEFFERSON

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED Monica Mendoza

WHO BEING BY ME DULY SWORN, DEPOSES AND SAYS THAT HE/SHE IS A NEWSPAPER REPRESENTATIVE FOR THE BEAUMONT ENTERPRISE; THAT SAID NEWSPAPER REGULARLY PUBLISHED IN JEFFERSON COUNTY CIRCULATED IN JEFFERSON, HARDIN, TYLER, NEWTON, ORANGE, JASPER, LIBERTY, SABINE, CHAMBERS, SAN AUGUSTINE, ANGELINA AND GALVESTON COUNTY(COUNTIES), TEXAS; THAT THE ATTACHED NOTICE IN SAID NEWSPAPER ON THE FOLLOWING DATE(S), TO WIT:
05-20-13

Monica Mendoza
NEWSPAPER REPRESENTATIVE

SWORN AND SUBSCRIBED TO BEFORE ME, THIS 21ST DAY OF MAY 2013,

TO CERTIFY WHICH WITNESS MY HAND AND SEAL OF OFFICE.

Elizabeth Ann Gonzales
NOTARY PUBLIC IN AND FOR
THE STATE OF TEXAS

ELIZABETH ANN GONZALES
NOTARY PUBLIC, STATE OF TEXAS
MY COMMISSION EXPIRES
APRIL 3, 2016

ELIZABETH Ann Gonzales
PRINT OR TYPE NAME OF NOTARY PUBLIC
MY COMMISSION EXPIRES 4/3/16

Draft Environmental Impact Statement Public Hearings

Lake Charles CCS Project

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LeucadiaEIS@NETL.DOE.GOV

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochrans Mill Road
P.O. Box 10940
Pittsburgh, PA, 15236

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Attachment 2

Public Meeting Materials

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Welcome

A public Draft Environmental Impact Statement (EIS) comment period, which is required as part of the NEPA and EIS process, enables the public to gather information about the proposed project and make comments on the Draft EIS.

This Draft EIS Public Hearing is designed to meet these goals by providing the public an opportunity to learn about the proposed project and comment on Draft EIS.

Your issues and concerns identified at the hearing and during the Draft EIS comment period will be considered by the U.S. Department of Energy (DOE) in the Final EIS.

The meeting format:

The meeting is open to the public at 5 p.m. A brief project presentation and formal hearing will start at approximately 7 p.m. Before and after the presentation, you can visit four information stations dedicated to a particular aspect of the project.

Four poster stations cover the following topics:

- Project Overview
- Environmental Review Process
- CO_2 Capture and Sequestration
- Analyzing Environmental Impacts

What topics are important to you and your community?

During the public Draft EIS comment period, you can provide comments in the following ways:

1. **Fill out a comment sheet and drop it in the comment box today.**

2. **Mail written comments at a later date to:**
   Ms. Pierina Fayish
   U.S. Department of Energy
   National Energy Technology Laboratory
   626 Cochrans Mill Rd.
   P.O. Box 10940
   Pittsburgh, PA 15236



3. **Submit comments via email at:**
   leucadiaEIS@netl.doe.gov

All electronic and written comments should reference DOE/EIS 0464

In order to be considered in the Final DEIS, **all comments (written or electronic) must be received by June 24, 2013.**

Lake Charles Carbon Dioxide (CO_2) Capture and Sequestration (CCS) Project

The **Lake Charles CCS Project** will capture and separate CO_2 from the process gas associated with the gasification process at the Lake Charles Clean Energy Gasification plant (LCCE Gasification plant), considered a connected action. The LCCE Gasification plant will use **petroleum coke ("pet coke")**, a lower value oil refinery by-product, to produce methanol, hydrogen gas, and sulfuric acid. The Lake Charles CCS project would contribute significantly to DOE program goals, including the large scale capture and sequestering of $CO_2$and research-focused MVA on over 1 million tons per year of CO_2.

CCS Technology

The Lake Charles CCS Project would demonstrate technology to capture and sequester CO_2 from an industrial facility including:

- **Capture of CO_2** from process gases in an acid gas removal system;
- **Compression of CO_2** to approximately 2,250 pounds per square inch;
- **Transport of CO_2** by pipeline; and
- **Research MVA** to monitor and confirm sequestration of CO_2 in a portion of the West Hastings oil field.

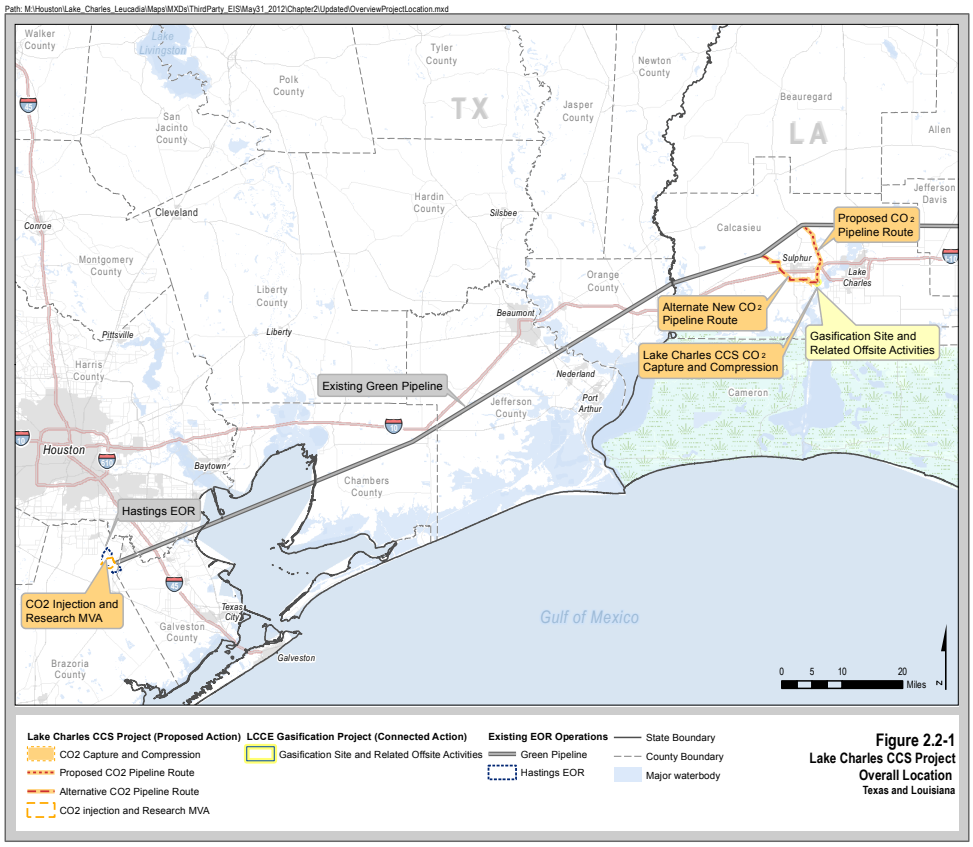


Figure 2.2-1
Lake Charles CCS Project
Overall Location
Texas and Louisiana

CO_2 Capture and Compression

The CO_2 capture equipment would consist of two Lurgi Rectisol Acid Gas Removal (AGR) units in which CO_2 is separated from the process gas. The compression equipment would include two compressors that would pressurize the CO_2 to 2,250 pounds per square inch gauge (psig) for transport and geologic sequestration. Approximately 4.6 million tons per year of CO_2 would be captured from the LCCE Gasification Plant.

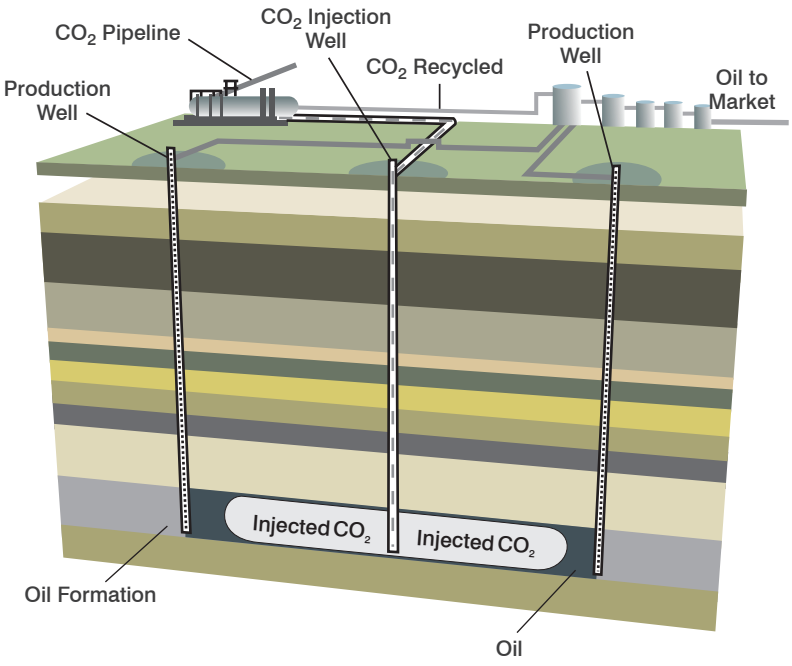
CO_2 Pipeline

Denbury, through an affiliate, would construct, own, and operate the proposed 11.9-mile-long CO_2 pipeline connecting to the existing Green Pipeline, which would transport the captured CO_2 to oil fields, including the West Hastings oil field, in Brazoria County, Texas.

CO_2 Sequestration Process

CO_2 Sequestration is the process by which CO_2 is injected into suitable geologic formation and permanently stored. The CO_2 captured by the Lake Charles CCS Project will be used in existing commercial Enhanced Oil Recovery (EOR) operations.

EOR is the process by which compressed CO_2 is used to increase the amount of crude oil that is extracted from an oil reservoir. CO_2 is injected into the reservoir which displaces the oil, allowing more oil to be extracted than compared to standard methods. After EOR operations are concluded, the CO_2 injected in the EOR reservoir is ultimately permanently stored within the reservoir.



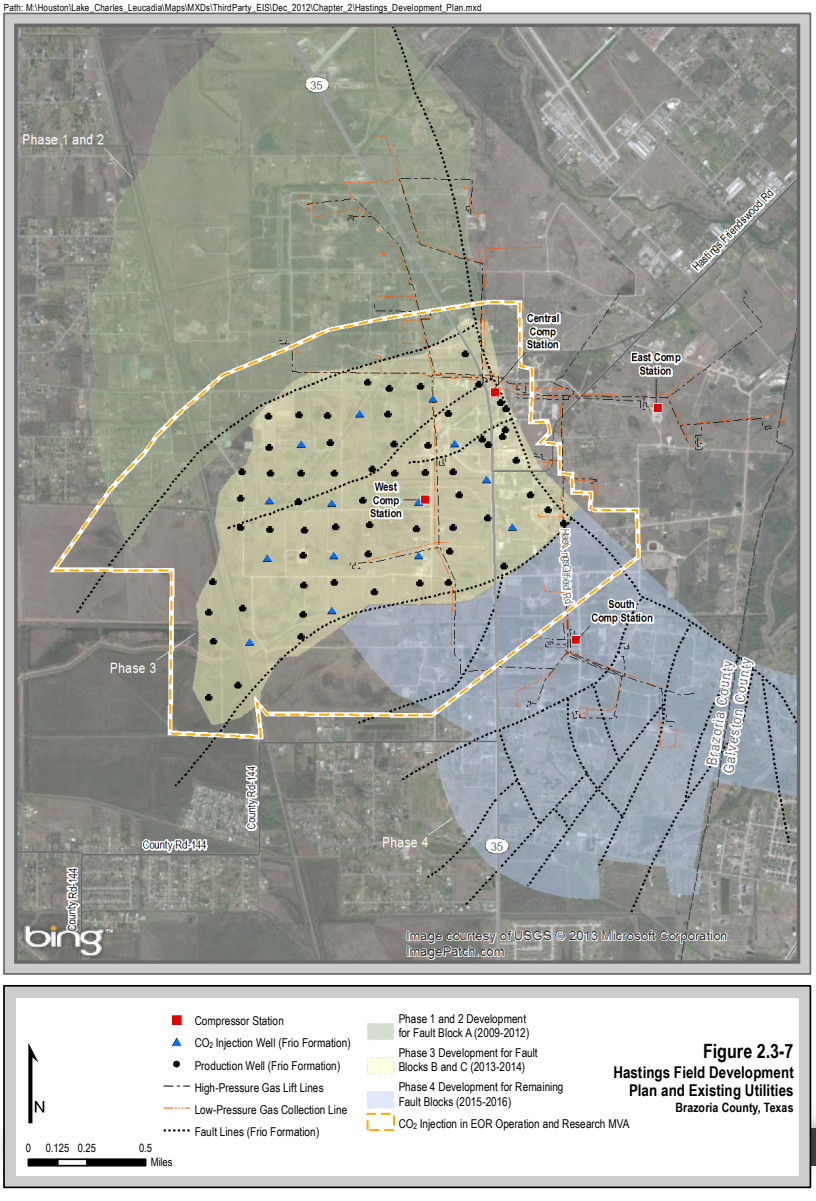


Figure 2.3-7
Hastings Field Development Plan and Existing Utilities
Brazoria County, Texas

West Hastings Research MVA Program

Denbury and the Texas Bureau of Economic Geology (BEG) would jointly implement the West Hastings research MVA program aimed at providing an accurate accounting of approximately 1 million tons of stored CO_2, and a high level of confidence that the CO_2 injected in a portion of West Hastings field during existing EOR operations will remain permanently sequestered. The West Hastings research MVA program would monitor for the possible CO_2 leakage through strata above the target EOR zones, and would also measure and analyze several geophysical parameters in an effort to detect or map CO_2 movement. The West Hastings research MVA activities would supplement Denbury's ongoing commercial monitoring activities and regulatory requirements performed for commercial CO_2 EOR and would provide additional information regarding the movement and confinement of CO_2.

Carbon Dioxide (CO_2) Facts

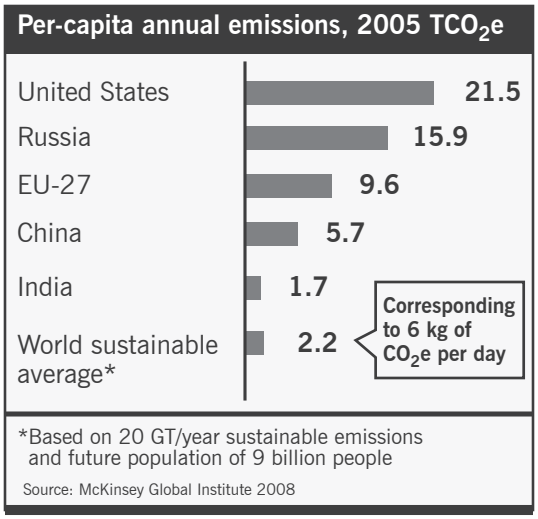


What is it?

Carbon Dioxide (CO_2) is a colorless, odorless gas naturally occurring in the earth's atmosphere. The carbon dioxide molecule (O=C=O) contains two double bonds and has a linear shape. Concentrations of CO_2 in the atmosphere vary seasonally but generally comprise approximately 0.04% of the air we breathe.

Carbon dioxide in the atmosphere is used by green plants for a process called photosynthesis. Photosynthesis uses CO_2 along with oxygen, water, and organic compounds to produce sugars that can be used as energy. CO_2 is also a byproduct of respiration in humans, animals, fungi, and some bacteria.

Human activities also generate CO_2 through the combustion or oxidation of materials that contain carbon, such as coal, wood, oil, or gasoline.



Role in Climate Change

Climate change is defined by the U.S. Environmental Protection Agency (EPA) as a major change in temperature, rainfall, snow, or wind patterns lasting for decades or longer. Climate change may result from natural factors and processes as well as human activities. Many human activities release greenhouse gases, such as CO_2, into the atmosphere and levels have recently increased. Since 1750, CO_2 levels in the atmosphere have increased by 36% (EPA 2009).

The major greenhouse gases from human activities are:

- **CO_2**
- **methane**
- **nitrous oxide**
- **hydrofluorocarbons**
- **perfluorocarbons**
- **sulfur hexafluoride**

The graph shows the total CO_2 equivalent (TCO_2e) which includes emissions of all greenhouse gases. As shown, the U.S. contributes the largest per capita annual emissions compared to other countries. According to EPA (2008), CCS is a key greenhouse gas mitigation strategy.

What happens to CO_2 during CCS?

As part of the oxidation of carbon fuels, CO_2 will be captured before it enters the atmosphere. The capture process includes removal of water, particulates, atmospheric gases (nitrogen, oxygen, argon), and other products of combustion (SOx, NOx, CO, and mercury) to trace levels. CO_2 will be compressed so it can be stored as a supercritical liquid. The CO_2 is then transported by pipeline to an underground storage site or Enhanced Oil Recovery (EOR) operations. The temperature and pressure at the underground storage site or EOR operations keeps CO_2 in the supercritical phase.

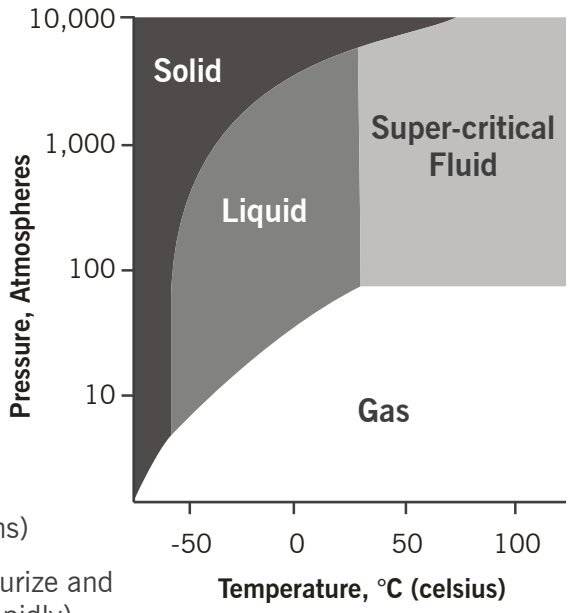
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Temperature/Pressure	CO_2 State
Standard Temperature and Pressure	• gaseous state with density of about 1.5 times that of air • no liquid phase at standard atmospheric pressure
Below -78 °C (-108°F)	• solid state (commonly called dry ice)
Above -78 °C (-108°F)	• solid CO_2 goes directly to a gas

Solid, Liquid, or a Gas?

Supercritical liquid phase of CO_2 only occurs at pressures greater than 72.9 atmospheres and temperatures of greater than 31.1°C (87.98°F). In this state, CO_2 adopts properties that are between a gas and a liquid. Supercritical CO_2 can expand to fill a container like a gas but has a density that is more like a liquid.

Supercritical CO_2 is used as a solvent in industry, since it is considered more environmentally friendly than other solvents.



Supercritical CO_2 is used in industry for:

- non-toxic solvent (including the decaffeination of coffee beans)
- enhanced oil recovery (CO_2 is injected into oil wells to pressurize and dissolve in underground crude oil, enabling the oil to flow rapidly)
- foaming of polymers/plastics

Is CO_2 Harmful?

CO_2 is not reactive, flammable, volatile, or corrosive under typical environmental conditions. CO_2 is not listed as one of 188 substances designated by EPA as Hazardous Air Pollutants for their effects on human health and ecosystems. CO_2 is present in the air we breathe at approximately 400 ppm. At very high concentrations, however, CO_2 is an asphyxiant.

NEPA

In 1969, **The National Environmental Policy Act of 1969 (NEPA)** established an environmental review process for actions undertaken by federal agencies. The NEPA process is designed to promote better decision making through scientific analysis, comment from expert agencies, and public involvement.

The U.S. Department of Energy (DOE) selected the Lake Charles Carbon Capture and Sequestration (CCS) Project for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Storage (ICCS) program. As a result, DOE has initiated the NEPA Process and issued a Notice of Availability (NOA) of the Draft Environmental Impact Statement (EIS) for the proposed funding of the Lake Charles CCS Project.



As Lead Agency, DOE is conducting a NEPA review prior to providing funding to Leucadia Energy LLC in order to develop the Lake Charles CCS Project. The Draft EIS builds on studies and analysis that has been performed for the Project by Leucadia.

The Draft EIS will provides a full and systematic analysis of the potential impacts, or environmental consequences, of the Proposed Action. The Draft EIS includes the following sections:

- An introduction that presents the **Purpose and Need** of the Proposed Action
- A range of reasonable **Alternatives** to the Proposed Action
- A description of the **Existing Environment**
- An analysis of the **Environmental Impacts** of each alternative
- The **Cumulative Impacts** of the Proposed Action
- **Mitigative Measures** proposed to minimize impacts to human health or the environment

The Draft EIS used to inform the public and to help public officials make decisions that are based on an understanding of the impacts or environmental consequences of the Proposed Action.

The EIS Process

The EIS process includes the following steps:

Notice of Public Scoping or Notice of Intent (NOI)

A required notice that announces DOE's intent to prepare an EIS. This step formally opens the public scoping process. The NOI is published in the Federal Register.

Scoping

An early and open process for determining the scope of issues to be addressed in the EIS. Federal, state, and local agencies and members of the public are encouraged to provide comments on issues that need to be addressed in the EIS. Scoping is conducted for a minimum of 30 days.

Draft EIS

The Draft EIS documents the methodology, analysis, and findings of the EIS process.

The Draft EIS is also supported by various environmental studies, including geological studies, wetland surveys, air quality analyses, land use evaluations, and socioeconomic analyses, among others.

Notice of Availability (NOA)

A formal notice placed in the Federal Register announcing that the Draft EIS or Final EIS is available for review.

The DOE also publishes the NOA in local newspapers.

Public Comment

Federal, state, and local agencies, as well as interested members of the public, are invited to provide written comments on the Draft EIS. The Draft EIS is made available for public review and comment for a minimum of 45 days.

The DOE also holds a formal hearing to receive oral comments from the public. An announcement of the public hearing is usually published with the NOA of the Draft EIS.

Final EIS

The Final EIS documents the comments received on the Draft EIS and includes a response to all comments received.

Record of Decision (ROD)

The formal record of the decision reached on the Proposed Action, published a minimum of 30 days after the NOA of the Final EIS.

The ROD is published in the Federal Register and copies are provided to appropriate agencies, organizations, and individuals. This completes the EIS process.

DOE Funding

Continued funding for the project is subject to conditions specified in the ROD.

Welcome

to the U.S. Department of Energy

DEIS Public Hearing

For comments on the
Draft Environmental Impact Statement (DEIS) for
providing financial assistance to Leucadia Energy LLC
for the Lake Charles CCS Project

Draft Environmental Impact Statement Overview

Description of Proposed Action



The U.S. Department of Energy (DOE) is conducting a NEPA review of its proposed action of providing financial assistance for the construction and operation of the Lake Charles Carbon Capture and Sequestration Project (Lake Charles CCS Project) by Leucadia Energy, LLC (Leucadia). The Lake Charles CCS Project will demonstrate advanced technologies that integrate CO_2 capture at industrial sources and monitor, verify, and account for the sequestration of CO_2 into underground formations. The proposed project includes the following components:

- Capture and compression of approximately 4.6 million tons per year of CO_2 emissions at the LCCE Gasification plant;
- Transport of CO_2 via a new pipeline that will connect to the existing Green Pipeline and to Denbury's existing Enhanced Oil Recovery (EOR) operation at the West Hastings oil field in Texas; and
- A research monitoring, verification, and accounting (MVA) program aimed at providing an accurate accounting of approximately 1 million tons of stored CO_2 and a high level of confidence that the CO_2 will remain sequestered permanently in a portion of the West Hastings oil field through existing EOR operations.

Description of Connected Action

As part of the EIS, DOE also evaluated and considered the impacts associated with the larger Lake Charles Clean Energy (LCCE) Gasification Plant, which is considered a connected action. The LCCE Gasification Plant includes:

- Gasifying approximately 2.6 million tons per year of petroleum coke, some of which will be obtained locally, to produce synthesis gas, or syngas, a mixture of gases, predominantly carbon monoxide (CO) and hydrogen (H_2).
- The syngas is further processed through a series of chemical, cooling, and separation processes to produce methanol, hydrogen, sulfuric acid, and CO_2.

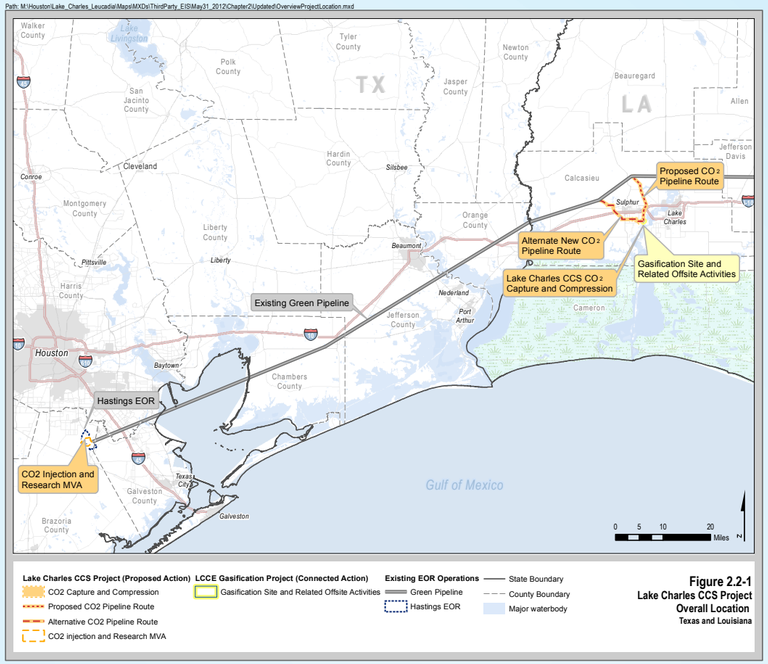


Figure 2.2-1
Lake Charles CCS Project
Overall Location
Texas and Louisiana

DOE Funding

DOE selected the Lake Charles CCS Project for an award of financial assistance through a competitive process under the Industrial Carbon Capture and Storage (ICCS) Program. Projects funded under the ICCS program are cost-shared collaborations between the government and industry to increase investment in clean industrial technologies and carbon capture and sequestration projects.

The Environmental Impact Statement (EIS) will inform DOE's decision on whether to provide financial assistance to Leucadia for the Lake Charles CCS Project. The financial assistance would apply to the planning, design, permitting, equipment procurement, construction, startup, and demonstration of the CCS technology and research MVA program.

Alternatives Considered

The National Environmental Policy Act (NEPA) requires that an EIS evaluate reasonable alternatives to an agency's proposed action. DOE is evaluating the project as proposed by Leucadia, one alternative CO_2 pipeline route, and the no action alternative.

No Action Alternative

Under the no action alternative, DOE would not provide funding to Leucadia. In this case, Leucadia could reasonably pursue several options:

- Neither the LCCE Gasification plant nor the Lake Charles CCS Project would be built; or
- The LCCE Gasification plant would be built, but the captured CO_2 would be vented to the atmosphere and not sequestered in an ongoing EOR operation.

Leucadia could build both the LCCE Gasification plant and the Lake Charles CCS project with funding from other sources. DOE assumes that if Leucadia builds the LCCE Gasification plant and Lake Charles CCS project in the absence of DOE cost-shared funding, the plant would include the same features, attributes, and impacts described for the proposed project and connected action.

Scope of the Analysis

DOE identified the scope based on internal planning, consultation with federal and state agencies, and the public scoping process. In addition to the elements described previously, the DEIS evaluates activities which already occurred and some which may be reasonably anticipated. This DEIS does not evaluate current commercial operations, including the Green Pipeline and existing EOR operations at the West Hastings oil field.



Lake Charles Carbon Capture and Sequestration (CCS) Project Overview

Capture and Compression

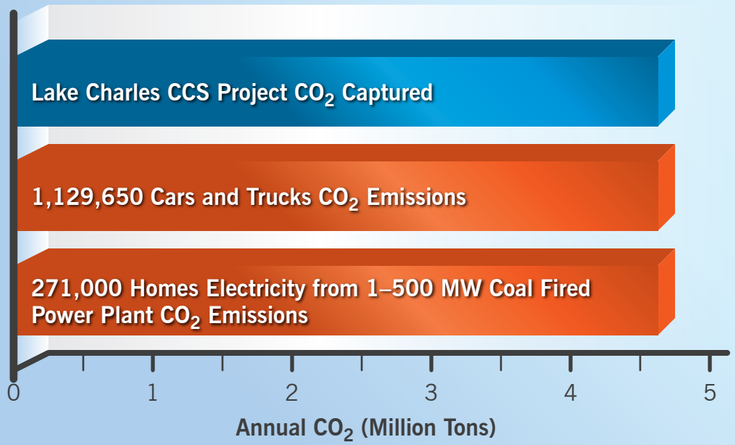
The Lake Charles Clean Energy Gasification Plant (LCCE Gasification Plant) is to be constructed by Lake Charles Clean Energy, LLC, in Calcasieu Parish, Louisiana. The gasification plant will utilize a lower value refinery by-product called “petroleum coke” to produce methanol, hydrogen gas, carbon dioxide (CO_2) and sulfuric acid.

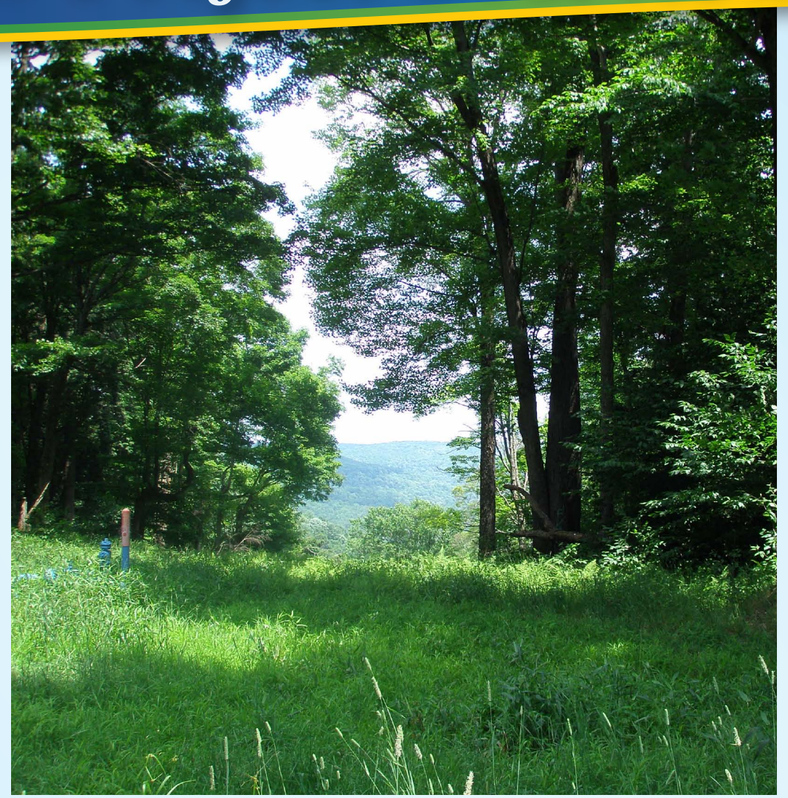
The Lake Charles CCS Project includes the incorporation of the CCS technology at the gasification plant that captures and compresses the produced CO_2. The following facilities would be incorporated:

- **CO_2 Capture.** Consists of two Acid Gas Removal (AGR) units where CO_2 is separated from the gasification process gas.
- **CO_2 Compression.** Includes two CO_2 compressors, the buildings in which the compressors are housed, and a meter station to monitor the volume of CO_2 that is exported.

Lake Charles CO_2 Capture and Emissions Comparison

The Lake Charles CCS Project will capture 4.6 Million tons of CO_2 annually, equivalent CO_2 emissions from a 500 MW coal fired power plant providing electricity to 271,000 homes, or CO_2 emissions from 1,129,650 cars and trucks over the same period.





Pipeline

Compressed CO_2 would be transported within a new pipeline, approximately 11.9 miles in length, to the existing Green Pipeline, near Buhler, Louisiana, for transport to existing enhanced oil recovery (EOR) operations along the Gulf Coast, including the West Hastings Oil Field in Brazoria County, Texas.

The new pipeline right-of-way (ROW) would parallel existing ROWs, such as roadways, pipelines, railroads, and transmission lines to the extent practicable.

Design of the new pipeline will be similar to new oil and natural gas pipelines and will comply with U.S. Department of Transportation rules for the transportation of hazardous liquids by pipeline.

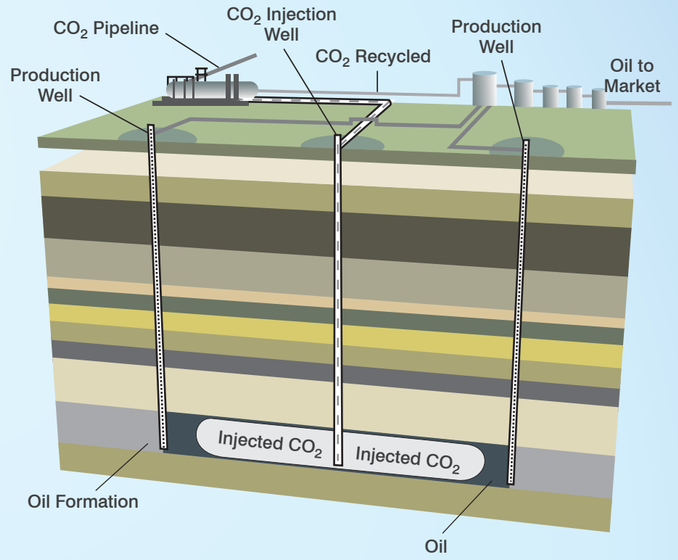
Sequestration and Research MVA

Compressed CO_2 is used in Enhanced Oil Recovery (EOR) operations to increase the amount of crude oil that is extracted from an oil reservoir. CO_2 is injected into the reservoir which displaces the oil, allowing more oil to be extracted than compared to standard methods. The injected CO_2 is recovered and recycled in a continuous process. Ultimately the CO_2 remains permanently stored within the reservoir as a result of the EOR operations.

A comprehensive research monitoring, verification, and accounting (MVA) program would be implemented over a portion of the existing CO_2 EOR operations at West Hastings oil field in Brazoria County, Texas. The research MVA activities would provide an accurate accounting of approximately 1 million tons of stored CO_2 and a high level of confidence that the CO_2 will remain permanently sequestered through the existing EOR operations.

The West Hastings Research MVA program includes:

- **Well Integrity.** Log and test wells to detect CO_2 migration.
- **Flood Conformance Testing.** Observe and model movement of CO_2 in subsurface formations during the EOR operations.
- **Above-zone Monitoring.** Monitor above the confining layer to provide additional information regarding the movement and confinement of CO_2.



Analyzing Environmental Impacts

The DEIS identified and analyzed the potential impacts of the proposed action: Provide financial assistance to Leucadia's Lake Charles CCS project. DOE analyzed each primary component of the Project including:

- Lake Charles Clean Energy (LCCE) Gasification Plant (the Connected Action)
- Lake Charles CCS Project: CO_2 Capture and Compression, CO_2 Pipeline, and West Hastings Research MVA Program

Water and Biological Resources



Construction and Operation Impacts

- Stormwater and waterwater discharges
- Use of water for dust control and pressure testing of pipelines
- Crossing of the Bayou D'Inde, Houston River, Bayou Verdine, Sabine River Canal, and two other minor waterbodies
- Temporary and permanent impacts to wetland and sensitive habitats

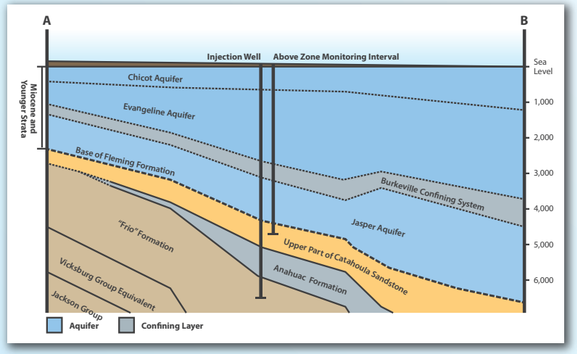
Minimization

- Implement Stormwater Pollution Prevention Plans and Spill Prevention and Countermeasures Control Plans
- Recycle and reuse stormwater and water when possible
- Use existing ROWs for pipelines where possible
- Use of Horizontal Directional Drilling (HDD) of waterbody crossings
- Mitigate loss of wetlands per U.S. Army Corps of Engineers permits

Geology

Construction and Operation Impacts

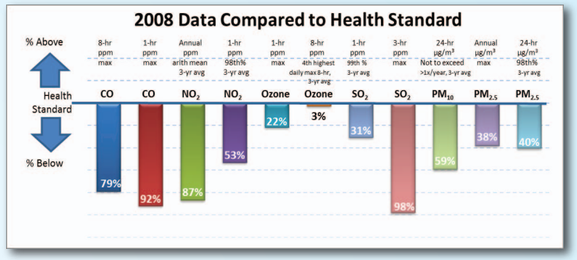
- Soil and prime farmland disturbance during construction
- Injection of approximately 4.6 million tons of CO_2 in the Frio Geologic Formation in an ongoing commercial EOR operation
- Minor leaks and spills from vehicles and material storage areas



Minimization Measures

- Use BMPs to reduce soil erosion
- Revegetate and restore disturbed areas
- Implement research MVA program including:
  - Well integrity testing
  - Model the location of injected CO_2
  - Monitor pressure, temperature and CO_2 in existing wells and soils

Air Quality and Climate



Criteria Pollutants

- SO_2 (Sulfur Dioxide)
- NO_2 (Nitrogen Dioxide)
- O_3 (Ozone)
- PM2.5 and PM10 (Respirable Particulate)
- CO (Carbon Monoxide)
- Pb (Lead)

Construction and Operation Impacts

- Dust and vehicle emissions during construction
- Emission of pollutants during operation
- Reduce emissions from shipping "petcoke" shorter distances

Minimization Measures

- Best Management Practices (BMPs) for dust suppression and vehicle emissions
- Best available control technology to reduce pollutant emissions
- Capture of 4.6 million tons per year of CO_2
- Capture of SO_2 to produce and sell sulfuric acid
- Operate within the June 29, 2012, approved Title V and PSD air permit

Socioeconomics

Construction

- 100 Construction workers (250 peak) for 3-4 months on the CO_2 pipeline
- 500 Construction workers (900 peak) for 36 months at LCCE Gasification plant



Operation

- 2 Additional workers to operate and maintain the CO_2 pipeline
- 187 New workers to operate the LCCE Gasification plant
- 14 Additional workers for 4 months, and 7 additional workers for 4 years to implement the research MVA program

Environmental Review Process

National Environmental Policy Act (NEPA)

NEPA requires federal agencies to conduct a thorough environmental review process before it undertakes, funds, or approves certain actions taken by the Federal Government. NEPA promotes better decision making through scientific analysis, comment from expert agencies, and public involvement.

The U.S. Department of Energy (DOE) conducted a NEPA review of its proposed action of providing financial assistance for the construction and operation of the proposed Lake Charles Carbon Capture and Sequestration Project (Lake Charles CCS Project). The Environmental Impact Statement (EIS) process begins with the public scoping period and concludes when DOE issues a Record of Decision (ROD) for the proposed action. Members of the public and other interested parties are encouraged to participate in the EIS process.



Environmental Impact Statement (EIS)

DOE prepared a Draft EIS, pursuant to NEPA, the Council on Environmental Quality (CEQ) NEPA Regulations, and DOE NEPA implementing procedures. The Draft EIS analyzes the potential environmental impacts of DOE's proposed action of providing financial assistance to Leucadia Energy LLC (Leucadia). The Draft EIS describes the following:

- Purpose and Need
- Proposed Action
- Alternatives
- Existing Environment
- Environmental Impacts
- Cumulative Impacts

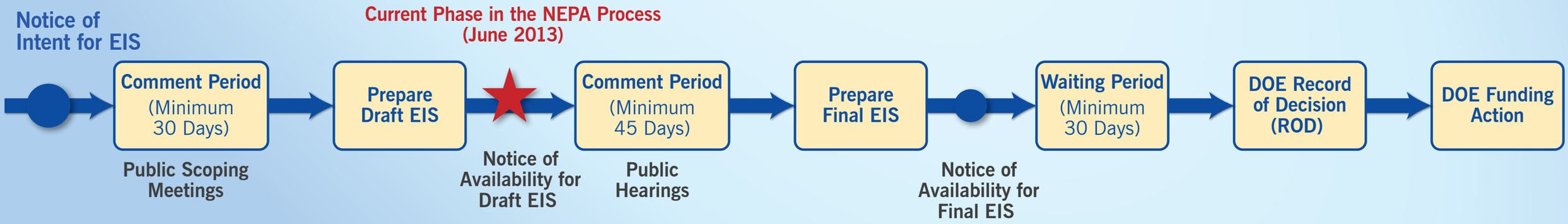


EIS Topics

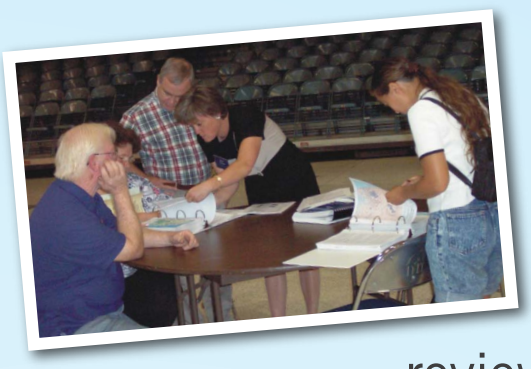
DOE analyzed impacts to resource areas associated with the Lake Charles CCS Project, as well as the larger LCCE Gasification Plant, which is considered a connected action. Resource areas included in the DEIS:

- Air Quality and Climate
- Geology and Soils
- Surface Water, Wetlands and Floodplains
- Groundwater
- Biological Resources
- Cultural Resources
- Land Use
- Socioeconomic and Environmental Justice
- Traffic and Transportation
- Noise
- Waste Management
- Materials
- Human Health and Safety
- Accident Analysis

NEPA Process



How to Comment



DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) PUBLIC HEARING provides an opportunity for public involvement in the environmental review process. Members of the public and other stakeholders are invited to comment on the environmental issues raised in the Draft EIS and also share their concerns for the proposed Lake Charles CCS Project.



These comments will assist DOE with preparing the Final EIS.

You can provide comments in several ways:

1. **Fill out a comment sheet and drop it in the comment box today.**

2. **Mail written comments at a later date to:**

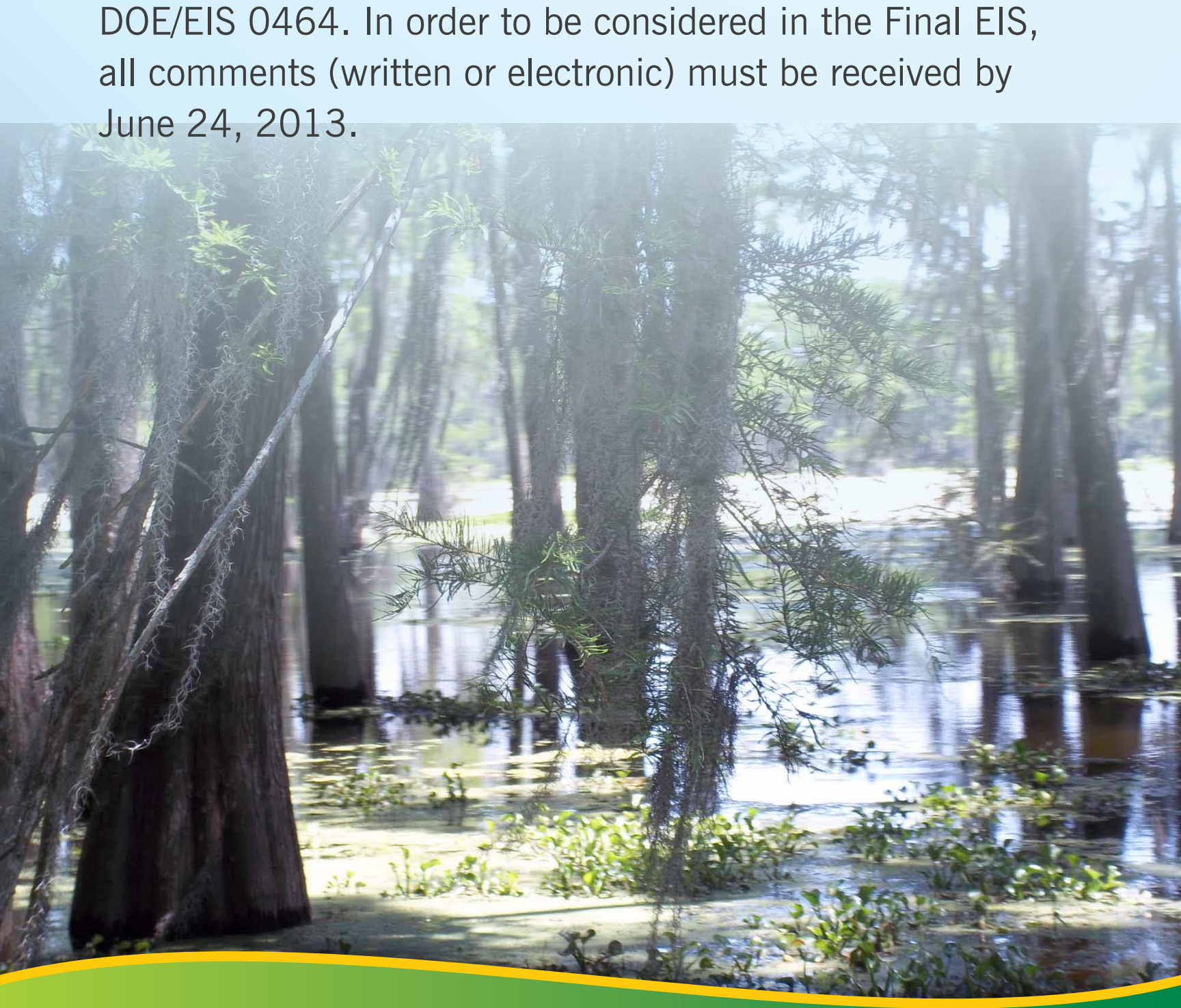


Ms. Pierina Fayish
U.S. Department of Energy
National Energy Technology Laboratory
626 Cochrans Mill Rd.
P.O. Box 10940
Pittsburgh, PA 15236

3. **Submit comments via email at:**

leucadiaEIS@netl.doe.gov

All electronic and written comments should reference DOE/EIS 0464. In order to be considered in the Final EIS, all comments (written or electronic) must be received by June 24, 2013.



DEIS Public Hearing Comment Sheet

Draft Environmental Impact Statement (DEIS) for the Lake Charles Clean Energy Gasification Plant (DOE/EIS 0464)

You are invited to comment on the Draft Environmental Impact Statement (DEIS). To be most helpful, comments should be clearly written and describe specific issues or topics. Comments may be submitted in one of the following three ways: **(1)** fill out this comment sheet and drop it into a comment box before leaving the hearing, **(2)** mail your comments using this form, or **(3)** e-mail your comments to leucadiaEIS@netl.doe.gov

All comments must be received by June 24, 2013.

*PLEASE PRINT * ADDITIONAL ROOM IS PROVIDED ON BACK*

1. **Name** _____

2. **Address** _____

3. **E-mail** _____

4. **Please check here** ☐ **if you would like to be on the mailing list.**

Please drop this form into one of the Comment Boxes here at the PUBLIC HEARING or fold (see fold lines on back) and mail.

YOUR INPUT MATTERS

02:EE-003122-0011-06

Place
Stamp
Here

Ms. Pierina Fayish
U.S. Department of Energy
National Energy Technology Laboratory
626 Cochrans Mill Rd.
P.O. Box 10940
Pittsburgh, PA 15236

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Attachment 3

Sign In Sheets

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Sign-In Sheet

Draft Environmental Impact Statement (DEIS) for the Lake Charles Clean Energy Gasification Plant (DOE/EIS 0464)

Date: 6/4/2013 Location: Westlake City Hall

Name Kirk Lord
Address Pasadena Tx 77505
Phone
Email
☐ Send Hard Copy of FEIS or ☐ Send CD or
☐ ONLY notify me of document availability

Name Charlie Atherton
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Phone
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☒ Send Hard Copy of FEIS or ☐ Send CD or
☐ ONLY notify me of document availability

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☐ ONLY notify me of document availability

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Name Josh Elliott

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Sign-In Sheet

Draft Environmental Impact Statement (DEIS) for the Lake Charles Clean Energy Gasification Plant (DOE/EIS 0464)

Date: June 4, 2013 Location: Westlake City Hall

Name MARK ECKARD
Address
LAKE CHARLES LA - 70605
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☐ ONLY notify me of document availability

Name Lee Sonnier III
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Phone
Email
☐ Send Hard Copy of FEIS or ☐ Send CD or
☐ ONLY notify me of document availability

Name John Jacob
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Lake Charles, LA
Phone
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☐ Send Hard Copy of FEIS or ☒ Send CD or
☐ ONLY notify me of document availability

Kami Hassan
Name
Address
Phone
Email
☐ Send Hard Copy of FEIS or ☐ Send CD or
☐ ONLY notify me of document availability

Name Rudy Cameron
Address
Phone
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☐ ONLY notify me of document availability

Name Bill ATCHISON
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Sign-In Sheet

Draft Environmental Impact Statement (DEIS) for the Lake Charles Clean Energy Gasification Plant (DOE/EIS 0464)

Date: 6/5/13 Location: Pearland, TX

Name BILL ATCHISON
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Name Luca Tamayo
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Attachment 4

DOE Presentation

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WELCOME

Public Hearing for the Lake Charles Carbon Capture and Sequestration (CCS) Project Draft Environmental Impact Statement

June 4 and 5, 2013

National Energy Technology Laboratory
U.S. Department of Energy

Agenda

7pm – Formal Public Hearing Begins

7:05pm – DOE Presentation

- DOE's Role
- Project Overview
- NEPA Overview
- Environmental Impact Statement (EIS) Process
- How to Provide Comments
- Meeting Logistics

7:20pm – Begin Receiving Oral Comments

Comments will be received until all registered speakers have had a chance to speak

Participants

- **Leucadia Energy, LLC. – Design, construct, and operate CO_2 Capture and Compression Facilities**
- **Denbury Onshore, LLC. – Provide CO_2 transportation and sequestration through existing Enhanced Oil Recovery (EOR) operations**
- **U.S. Department of Energy National Energy Technology Laboratory – Lead Environmental Impact Statement preparation**
- **Ecology and Environment, Inc. – Environmental consultants preparing the EIS**

DOE's Role

- In Section 703 of the Energy Independence and Security Act of 2007 (Public Law 110-140), Congress directed DOE to "carry out a program to demonstrate technologies for the large-scale capture of carbon dioxide from industrial sources."
- DOE sought applications in a funding opportunity announcement (FOA) in June 2009.
- Congress appropriated funding for ICCS in the American Recovery and Reinvestment Act of 2009, Public Law 111-5 in order to stimulate the economy in addition to furthering DOE's existing carbon capture and sequestration objectives.

Industrial Carbon Capture and Sequestration (ICCS) Program Overview

- Projects funded under this ICCS program are cost-shared collaborations between the government and industry to increase investment in clean industrial technologies and carbon capture and sequestration projects.
- Key objective is the successful development of advanced technologies and innovative concepts that reduce emissions of CO_2 into the atmosphere.
- DOE's two specific objectives
  - Technology Area 1 - Large-Scale Industrial CCS Projects from Industrial Sources, and
  - Technology Area 2 - Innovative concepts for Beneficial CO_2 Use.
- The Lake Charles CCS Project was one of three projects chosen under Technology Area 1.

Industrial CCS Project Objectives and Targets
Large-scale CCS from Industrial Sources (Area 1)

Objectives

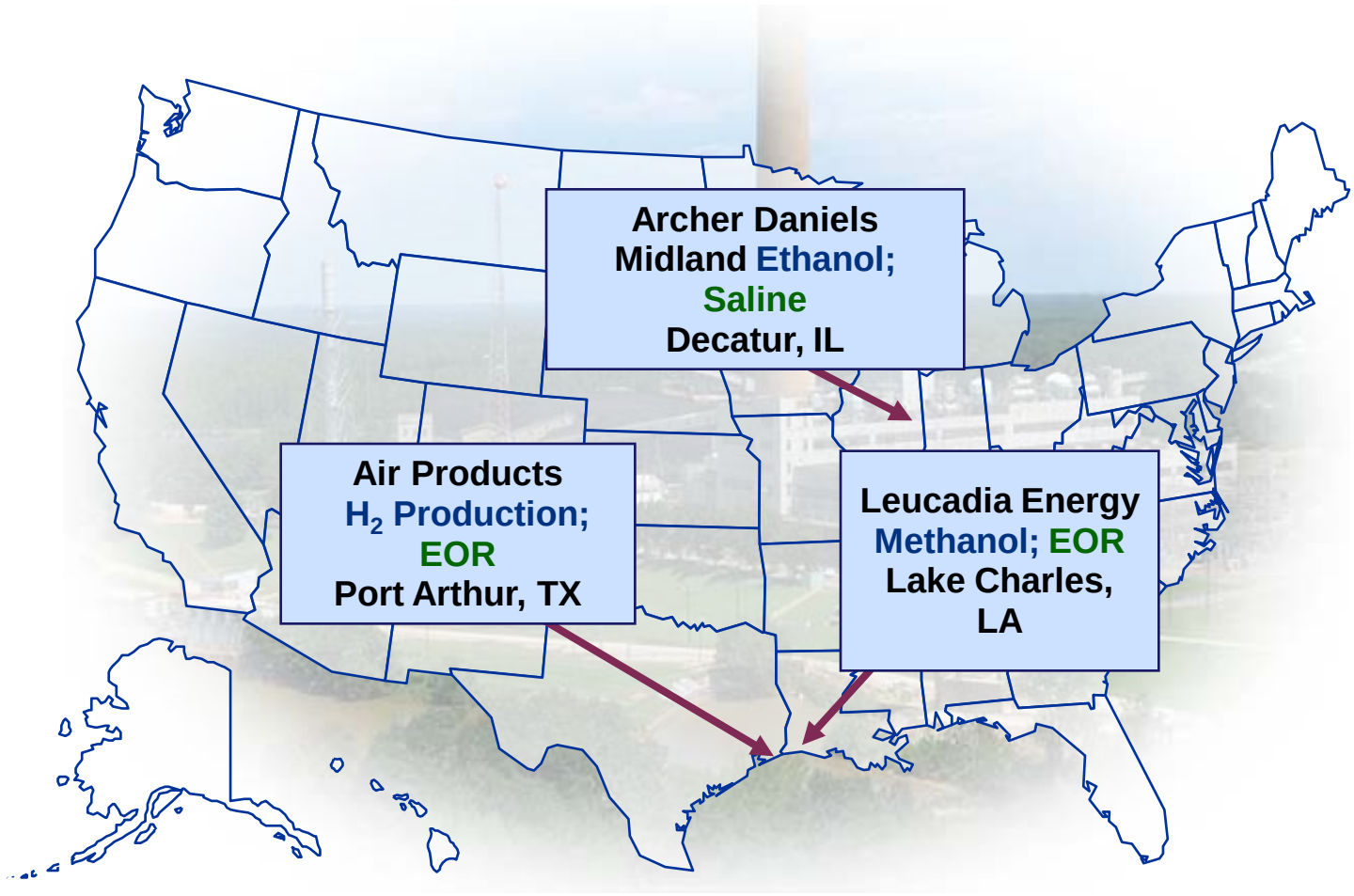
- Demonstrate advanced CCS technologies
- To progress beyond the R&D stage of readiness
- Integration with comprehensive Monitoring, Verification & Accounting (MVA)
- Demonstrate sequestration option

•Target

- Industrial sources
- Industries may produce heat, fuels, chemicals, hydrogen or other useful products with or without electricity production
- 1MM tons/yr of CO_2 emission from each plant for CCS

Project Locations for ICCS Area 1

Carbon Capture and Storage from Industrial Sources Phase 2



LEGEND
Project
Industry Product
Sequestration
Type
Location

Project Overview

- DOE's proposed action is to provide cost-shared funding for the design, construction, and operation of the Lake Charles Carbon Capture and Sequestration (CCS) Project.
- The Lake Charles CCS Project includes:
  - Incorporation of CO_2 capture and compression technology at the Lake Charles Clean Energy Gasification Project, in Calcasieu Parish, Louisiana.
  - Transport of CO_2 via a new 11.9 mile pipeline to the existing Green Pipeline, then to existing Enhanced Oil Recovery (EOR) operations along the Gulf Coast.
  - Research monitoring, verification and accounting (MVA) to monitor and confirm sequestration of CO_2 at existing EOR operations at a portion of the West Hastings Oil Field, Texas.

Overview of Carbon Capture and Sequestration Process



Lake Charles Clean Energy Gasification Project

Separation and Compression of CO_2

Denbury Green Line Pipeline

Sequestration In Ongoing EOR by Denbury

Monitoring

Verification

Accounting

Lake Charles CCS Project Location

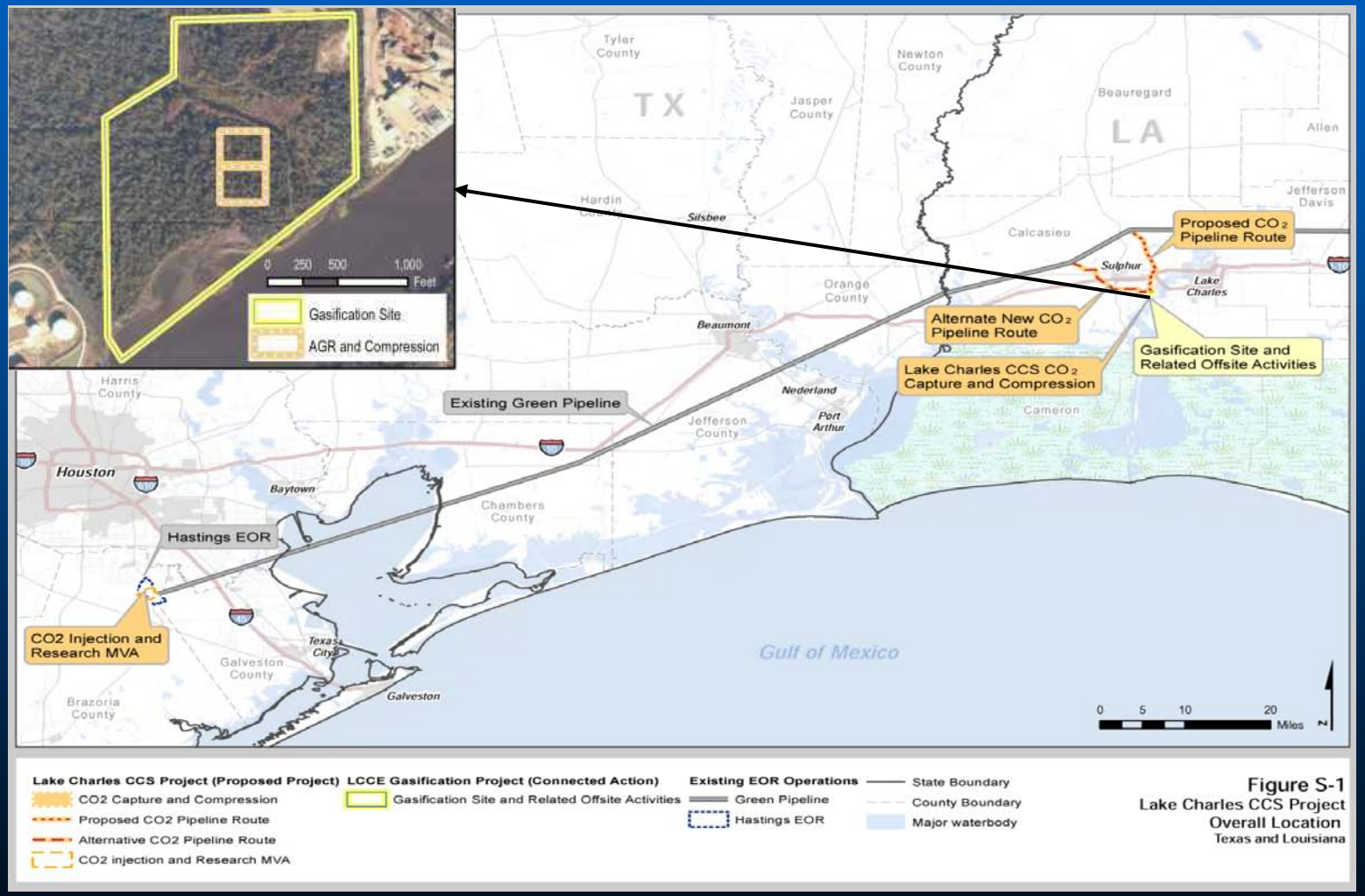
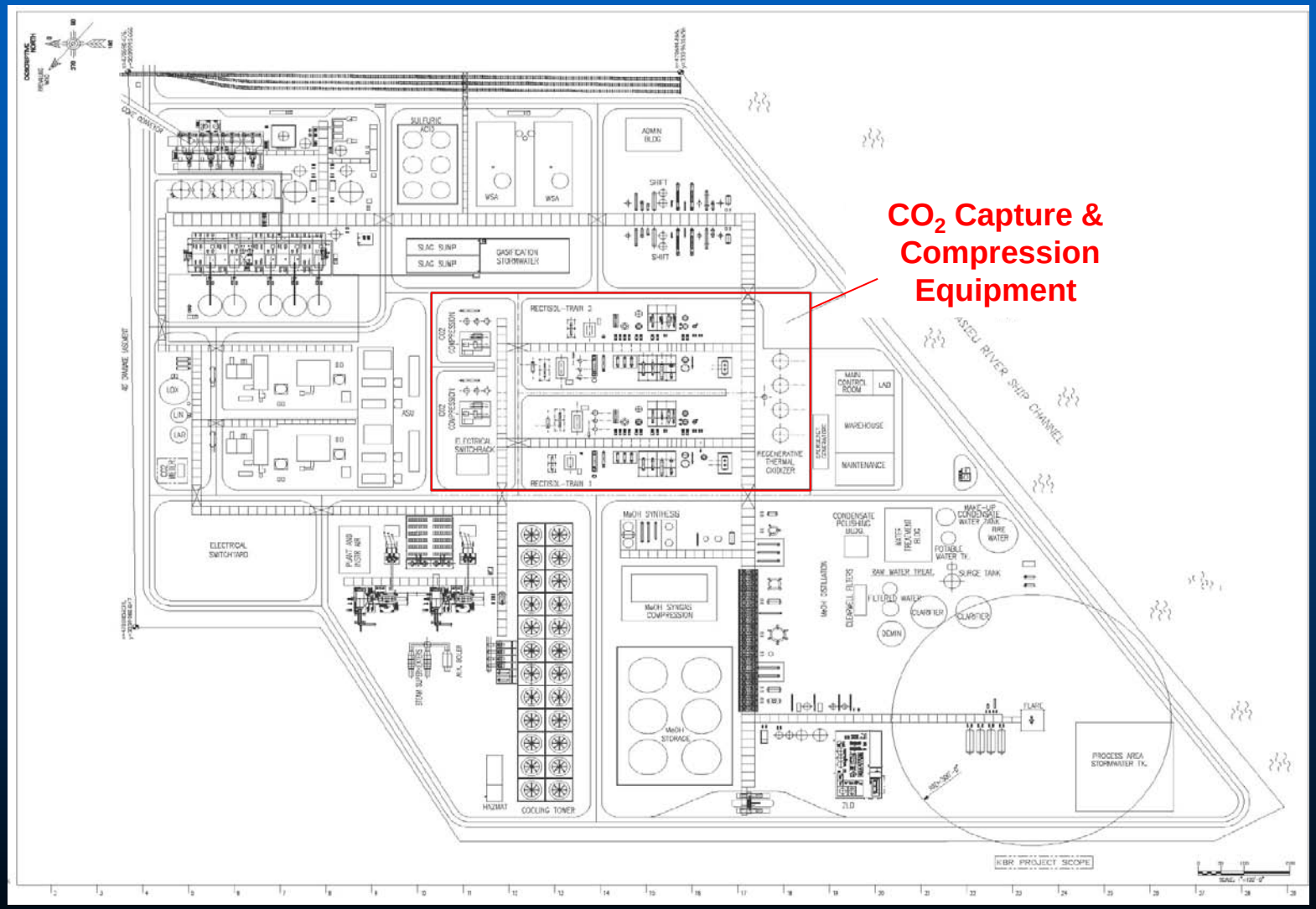


Figure S-1
Lake Charles CCS Project
Overall Location
Texas and Louisiana

Lake Charles Clean Energy Gasification Project Description

- Gasify over 2 million tons per year of petroleum coke to produce syngas (a mixture of primarily hydrogen (H_2) and carbon monoxide (CO), but also includes CO_2, water, and other constituents)
- Convert syngas into over 1.2 million metric tons of Methanol as well as hydrogen
- Key air and water permits obtained
- 3 year construction period beginning 2013

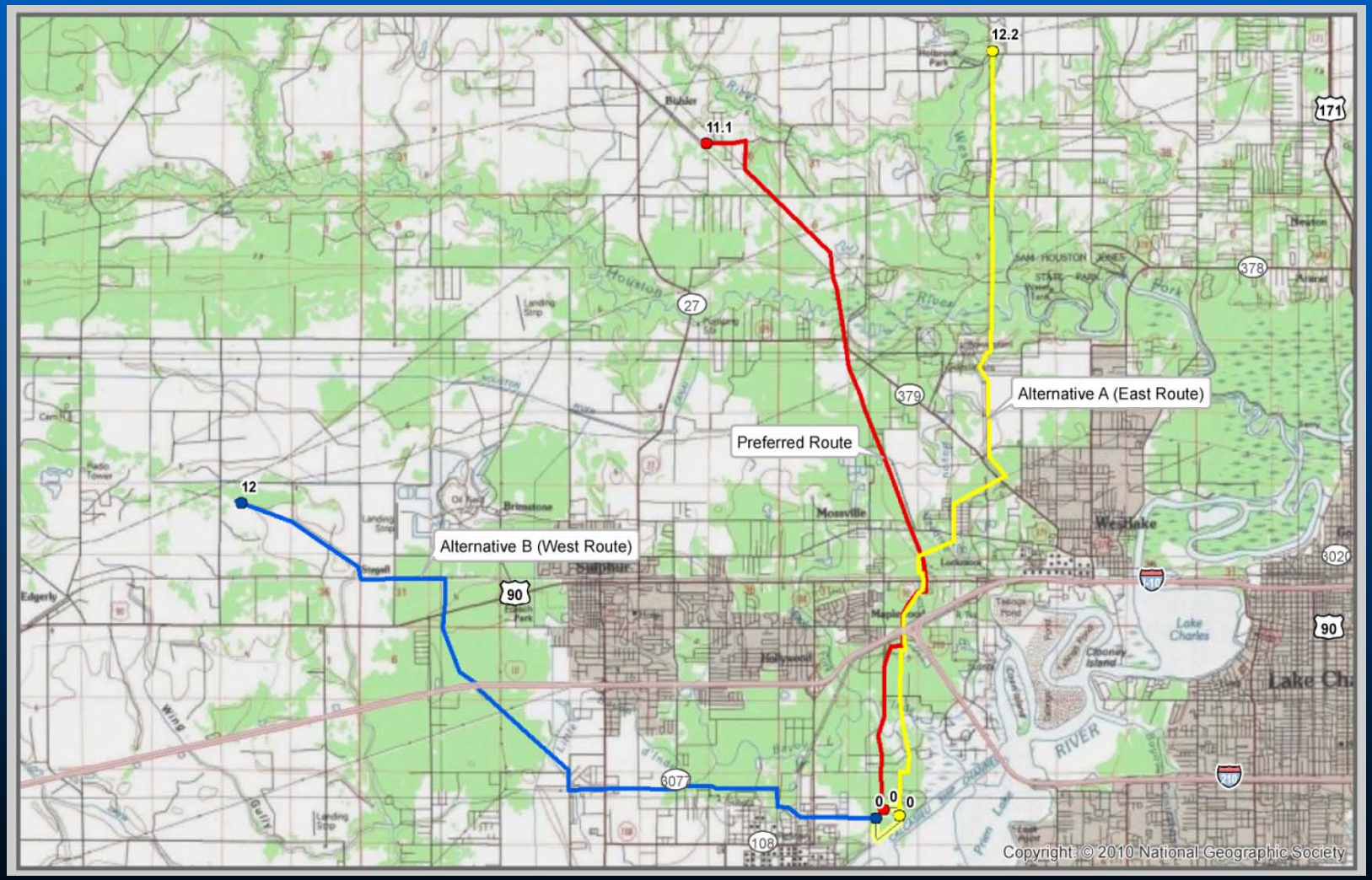
CO_2 Capture and Compression



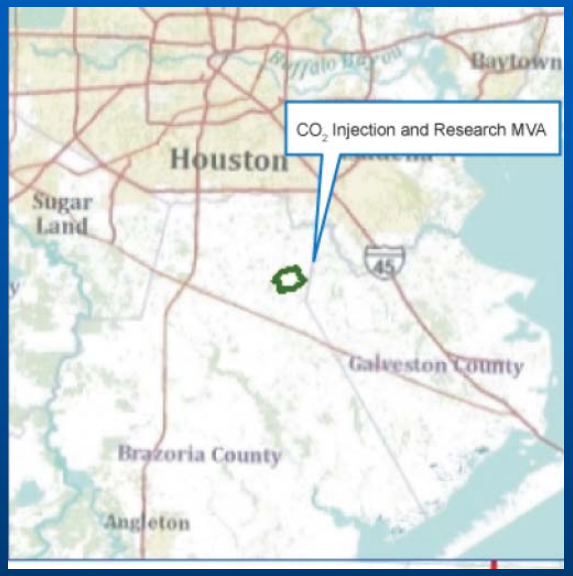
CO_2 Transportation via Pipeline

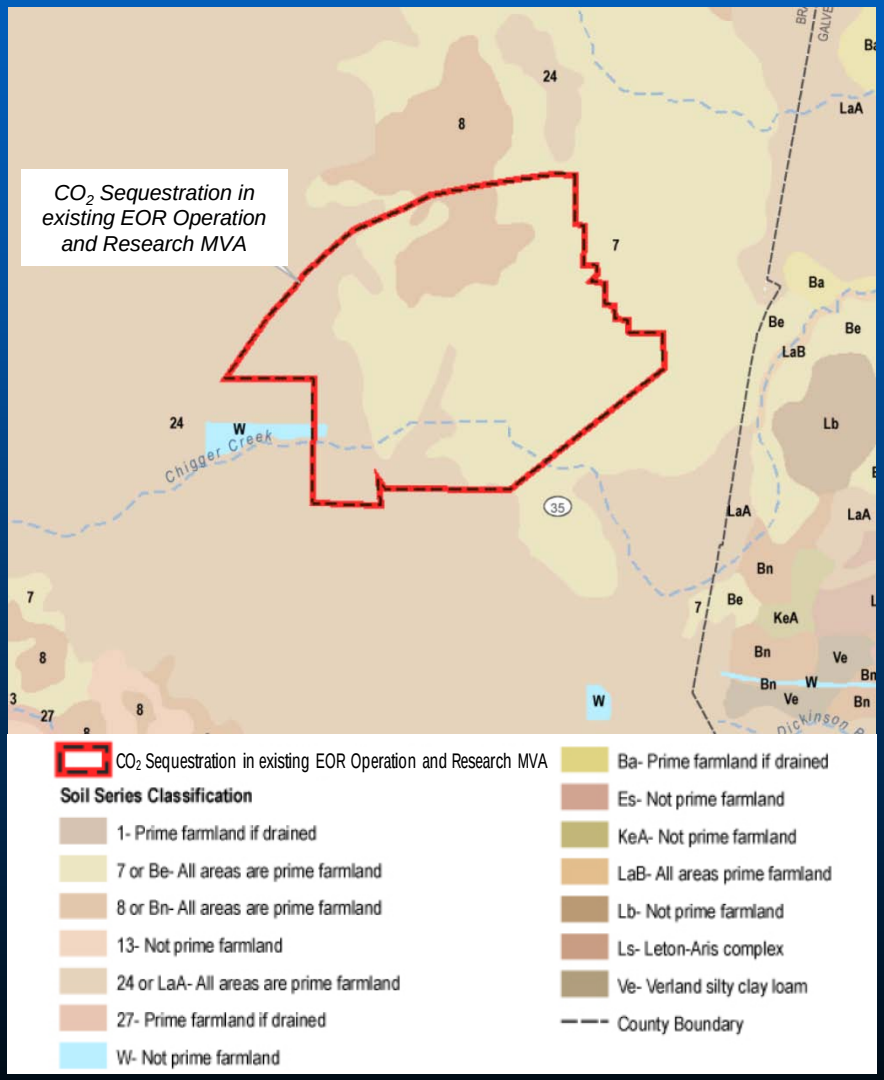
- An 11.9 mile CO_2 pipeline will be constructed from the Lake Charles Gasification project to connect to Denbury's existing Green Pipeline
- Pipeline Route design will parallel existing corridors such as roadways, pipelines, railroads and transmission lines to the extent practicable

Preferred Pipeline Route & Alternatives



MVA Location—Hastings Oil Field





MVA Program

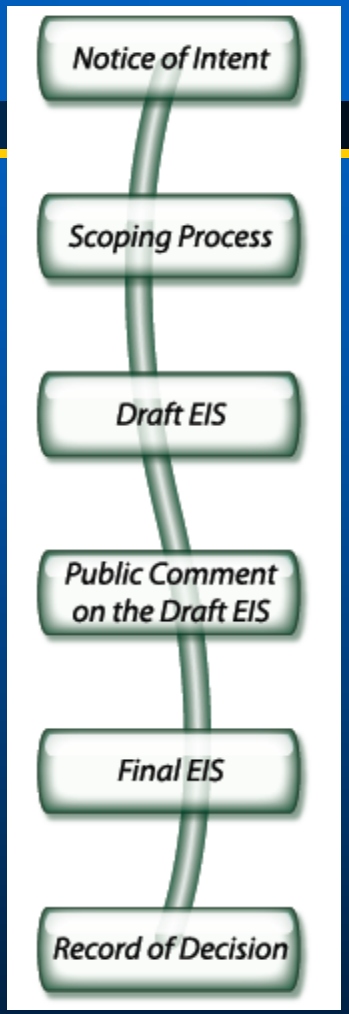
- Research MVA will take place in a portion of the West Hastings oil field.
- Research MVA will be implemented by Denbury and the Texas Bureau of Economic Geology to provide an accurate accounting of approximately 1 million tons of stored CO_2 and a high level of confidence that the CO_2 injected through the existing, commercial EOR process will remained sequestered.

National Environmental Policy Act (NEPA) Overview

- U.S. Federal Law – effective January 1, 1970
- NEPA established an environmental review process for actions undertaken by federal agencies.
- Designed to promote better decision making through scientific analysis, comment from expert agencies and public involvement.

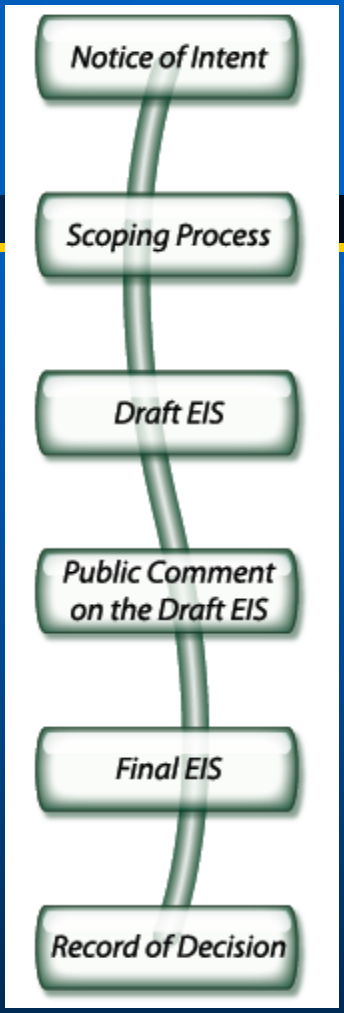
Environmental Impact Statement (EIS) Process

- Notice of Intent (NOI)
  - States the need for action and provides preliminary information on the EIS scope including the alternative actions to be evaluated
- Public Scoping Period
  - DOE requests comments from the public on the scope of the EIS (alternatives to be evaluated and environmental impacts to be analyzed)
  - Last 30 days, and includes a public meeting
- Draft EIS
  - Comments received during Scoping Period are considered by the DOE in preparation of EIS
  - EIS includes a comparison of various alternatives including the “no action” alternative



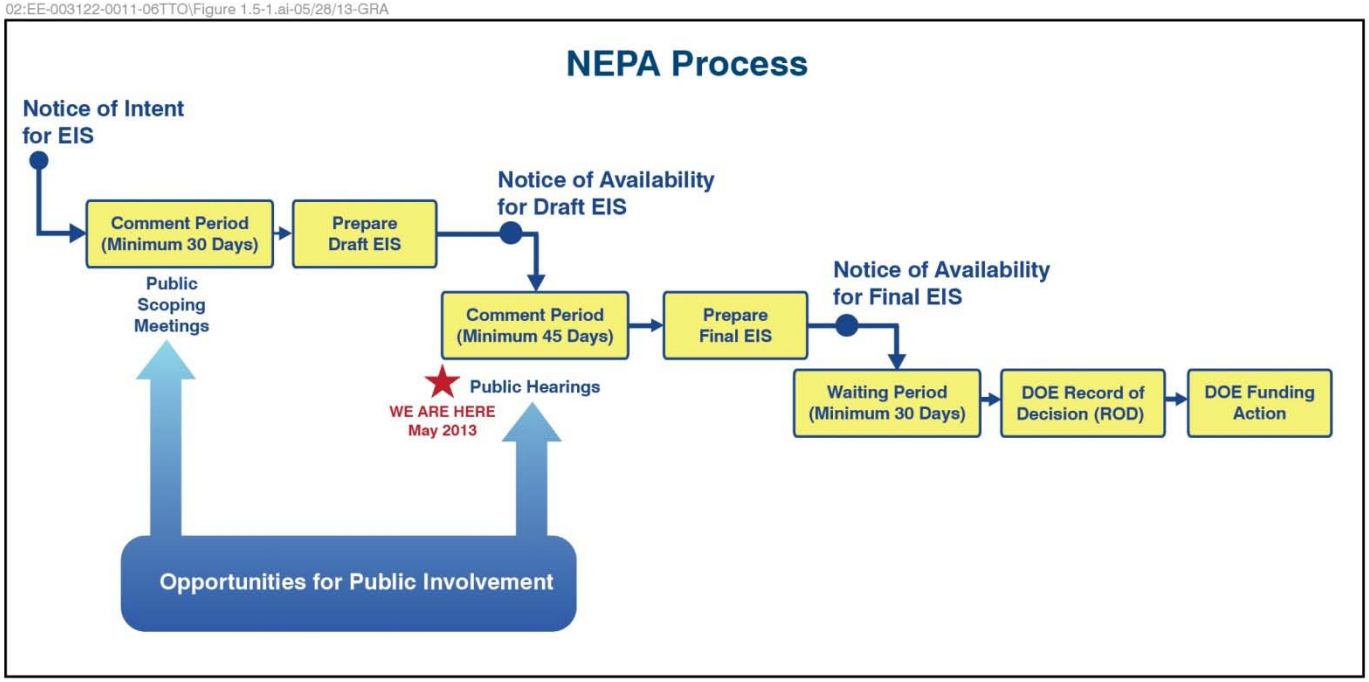
EIS Process

- **Public Comment on the Draft EIS**
  - Comment period lasts 45 days
  - Public hearing conducted to take comments and concerns with the content of Draft EIS
- Final EIS
  - DOE considers all timely public comments on the Draft EIS
  - DOE identifies the preferred alternative
- Record of Decision
  - DOE announces and explains DOE's decision and describes any necessary commitments for mitigating potential environmental impacts



EIS Process

02:EE-003122-0011-06TTO\Figure 1.5-1.ai-05/28/13-GRA



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Figure 1.5-1 NEPA Process Flow Chart

Schedule

Milestone	Date
Draft EIS published	May 10, 2013
Public Hearings on the Draft EIS	June 4 and 5, 2013
End of Public Comment Period	**June 25, 2013**
Final EIS	Fall 2013
Record of Decision (ROD)	Fall 2013

How to Provide Comments

- **Comments DUE June 25, 2013**
- **Submit oral or written comments today**
- **Email written comments to LeucadiaEIS@NETL.DOE.GOV**
- **Mail written comments to the address listed in NOI**

Ms. Pierina Fayish,
U.S. Department of Energy
National Energy Technology Laboratory
626 Cochrans Mill Road
P.O. Box 10940
Pittsburgh, PA 15236

- **Fax comments to:**
  - **412-386-4775**

Logistics for Oral Comments

- Speakers must pre-register at sign-in table
- Five (5) minutes per speaker, please
- Please state your name/organization and speak clearly
- Additional opportunity to speak after all registered speakers, time permitting
- An official transcript will be made after the meeting
- Written Comment sheets are also available

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Attachment 5

Public Meeting Transcripts and Written Comments Received

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DRAFT ENVIRONMENTAL IMPACT STATEMENT

FOR THE LAKE CHARLES

CLEAN ENERGY GASIFICATION PLANT

* *

PUBLIC HEARING

In regards to the public hearing scheduled to be held June 4, 2013 at the Westlake City Hall, 1001 Mulberry Street, Westlake, Louisiana, starting at 7:00 p.m., reported by Betty C. Minton, CCR, RPR, LCR.

APPEARANCES:

Pierina Fayish, U.S. Department of Energy

Greg O'Neil, U.S. Department of Energy

Don Maley, Leucadia National Corporation

* * *

MR. O'NEIL:

Okay. Welcome everybody. It's good to have a good turnout tonight. Welcome to the Lake Charles Draft Environmental Impact Statement, DEIS. My name is Greg O'Neil. I work for the U.S. Department of Energy at the National Energy Technology Laboratory. I'm the project manager for the government portion of this project so one of my roles is to make sure that the public's interest is being represented and the project is meeting its congressional mandate as well.

I'm going to go through a few slides here. I'm going to turn it over after the introduction to Don Maley who's with Leucadia. He will go through some projects and specific slides. And after that another Department of Energy employee, Pierina Fayish, who is in charge of dealing with the process of specific comments

that you may have and how they will get addressed. If you are going to send them in written form, she will address those in the final EIS.

Okay. This is the agenda. We're going to do a short presentation as I just said. A DOE presentation and then more specifics about the Leucadia project and then the NEPA process. About 7:20 more or less, we'll begin to receive oral comments from the public. We'll start at 7:20 or thereabouts and we'll go as long as we need to go, as long as there are people who still have something to say. We want to hear what everybody has to say.

So here tonight we have the participants in the project: Leucadia Energy, several representatives from Leucadia, several representatives from Denbury Onshore. Denbury's part of the project is the CO2 portion of the project. They're going to be doing the enhanced oil recovery part of the project, myself and Pierina from the

Department of Energy, National Energy Technology Laboratory, and then we have people here from technology and environment who were the consultants who prepared the EIS. So all of the experts on the various environmental aspects of the project are here with the DOE.

The DOE's role here, Congress directed the DOE to carry out a program to demonstrate technologies for the large capture of carbon dioxide from industrial sources. There was a funding opportunity announcement in June 2009 to serve that purpose. The money was provided in the Recovery Act of 2009 in order to stimulate the economy in addition to furthering the existing carbon capturing sequestration objectives.

So out of that project the Recovery Act, the ICCS program was born. ICCS stands for Industrial Carbon Capture and Sequestration. There are other projects that have to

do with capture from power plants. This program is specifically organized around industrial projects.

So the way this is organized is you have all of these projects that are three of them in the major projects category in Area I and this is one of those projects. They're all cost-shared collaborations which is very important.

So with the DOE, we want to have as high a cost-share as possible with the company performing the program because that means they've got skin in the game. They have got every incentive to keep costs down to make sure the project is managed effectively.

So it's very important to know that Leucadia and Denbury are actually putting up overall for the project a much larger portion of the money than the government is. Now, for just the carbon capture portion of the project, we're cost-sharing this at a -- we're

paying 60 percent Leucadia is paying 40 percent. Still 40 percent is still a very substantial cost-share and that's just for the small part of the project and that's for capturing and storing the carbon.

The two specific objectives of the ICCS Program there was Technology Area I and II. Technology Area I was large scale ICCS projects from industrial sources. This is under that part of the project. There was also a Technology Area II that had to do with innovative concepts for beneficial CO2 use. There were a lot of smaller projects that fell under that umbrella that's not relevant to this discussion tonight. So this is one of the three chosen under Area I.

The objectives of the Industrial CCS project, so it demonstrated advance CCS Technology, Projects that have gone beyond the R&D stage. So these are large scale demonstrations to take things from the

lab or from, you know, pilot scale and make a large scale demonstration to show that this can, in fact, work at an industrial scale.

These projects all had to incorporate a comprehensive MDA, so monitoring, verification and accounting of the CO2, in other words track what happens to the CO2 or track what happens to CO2 in general when you put it into a sequestration operation. Does it stay sequestered and demonstrate the sequestration option. So in the past, we've done other projects that did not have to do sequestration. All of these projects had to do with carbon capture and sequestration.

The target was industrial sources. So you don't see projects whose main purpose was power production. You see projects whose main purpose is to produce things like heat, fuels, chemicals, hydrogen or other useful projects. Now, they could

have a minority electricity production but the primary purpose couldn't be electricity production.

And the target was around a million tons of CO2 emission from each plant. There's a little bit of flexibility but the idea was that we wanted big projects. So a million tons was the informal target we were looking for and that was what was in the funding opportunity analysis.

So all the projects that were selected, which were these three, are that scale. You have this project as you see in Lake Charles. You have just down the road, you have the air products project in Port Arthur, Texas that is a hydrogen production at the Valero Refinery. They're also doing EOR with Denbury.

And then up in Illinois, we have the ADM, Archer Daniels Midland Project. That project is an ethanol plant so they're capturing and dehydrating the CO2 from the ethanol

plant and putting it in a saline formation underground. So they're not doing EOR. It's a little bit different.

But that's the diversity of projects that the ICCS Area I program have.

I think at this point, I'm going to turn it over now to Leucadia Energy, Don Maley. This is where I step aside.

MR. MALEY:

Thank you, Greg. Good evening, everyone. Thank you for coming out tonight. I'm going to go through a few slides and give a quick overview of our ICCS Project here in Lake Charles and try and go through those relatively quickly so we have plenty of time for your comments.

As Greg mentioned this is a cost-sharing program for design, construction and operation of a carbon capture and sequestration project as part of our overall PECO gasification

to methanol and hydrogen facility. We incorporate CO2 capture and compression technology at our facility in Calcasieu Parish.

Denbury Resources will be building an 11.9 mile pipeline down from their existing green pipeline which currently takes CO2 from their Jackson dome in Mississippi over to their West Hastings fields south of Houston. So it will be just tapping into that pipeline. And they'll be using our CO2 for their existing enhancement oil recovery operations over south of Houston.

An important part of this project that Greg mentioned is the MVA, monitoring, verification and accounting. That's the work that will be done at the field by Denbury.

So just a quick overview of our capture and sequestration process. Our facility will be taking petroleum coke and turning that into a raw SynGas, synthetic gas, through the gasification

process. We then have to clean up that gas so it can be used in the production of our final products.

A significant portion of that clean-up involves separating our CO2 at the facility and then compressing that so it can be injected into the pipeline. So the Denbury green line actually will come down right to our plant gate and we will compress the CO2 and inject it into the pipeline right at our plant gate.

They will transport it on their pipeline system over to the field in Texas and there it'll be pumped into the ground and sequestered as part of their ongoing enhancement oil recovery operations.

And there again an important part of this project, this is an existing field. They've been using CO2, naturally occurring CO2, injecting that into the ground for an enhanced oil production for a number of years, but they never conducted any of the

monitoring, verification or accounting activities so that we can really study and test how effective this process is.

The picture up in the top left-hand corner is a picture of our site on the Calcasieu River. The little rectangle in the middle, the block in the top is where the gasification block will sit and produce the raw gas and then the lower block is where the CO2 will be separated and compressed for injection to the pipeline.

I think we'll have a later slide that will show a little better, but you see the plant site over on the right-hand side and two kind of red squiggly lines going up to the green line which is the gray line that runs from Lake Charles down over to the Hastings field in Houston.

This is highlighting two routes -- two of the three routes that were studied as part of our program with the Department of Energy and were part of

the overall evaluation.

So our plan is to gasify over two million tons a year of petroleum coke to produce our raw SynGas that will have a significant portion of carbon dioxide included in that process. We will take the clean SynGas and convert that into 1.2 million metric tons a year of methanol, as well as a significant production of hydrogen.

We have obtained all of our key air and water permits and we are moving forward with our final design and financing plans and expect to break ground and begin construction of the project prior to the end of this year.

This is plat plan of our facility over on the Calcasieu River. The block in red is the equipment. That's a part of this project that we've engaged with the Department of Energy. As you can see, it's a significant part of the overall activities is to capture CO2 in a pure

stream, compress it and ship it to oil fields for sequestration.

As we mentioned, this will go by pipeline to the Denbury's existing green pipeline. The design parallels existing corridors such as roadways, pipelines, railroads and transmission lines to the extent practical.

These in yellow, red and blue were the three possible routes that were evaluated as part of this program with the Department of Energy. The preferred route is outlined in red and that is the line that was apparently planned for the construction of the connecting pipeline.

This again is a map of the field, the West Hastings field south of Houston so the CO2 will be piped over to this facility and injected into the ground. It will enhance the recovery of oil production from this oil depleted field and then ultimately be permanently sequestered at that site.

The MVA program, monitoring,

verification and accounting will take place on a portion of the field. That will be implemented by Denbury and the Texas Bureau of Economic Geology to provide an accurate accounting of approximately a million tons of stored CO2 and to produce a high level of confidence that the CO2 injected through the existing commercial EOR process will remained sequestered.

And with that, I will turn it over to Pierina.

MS. FAYISH:

Good evening, everyone. Thank you so much for coming out to participate in the EIS process by providing your comments and thoughts on the project. Before DOE can make a decision on whether to fund or not fund a project, we have to follow a law called the National Environmental Policy Act that requires us to review any environmental impacts -- any impacts to the human environment for actions undertaken by federal agencies

so that would include co-funding this project with Leucadia. And by this project, I refer to the CCS portion of the project, the capture and compression.

The overall larger plant site is considered in the EIS as a connected action because it cannot be separated from the process of the compression and capture.

The environmental impact statement process can be lengthy as you know if you were here two years ago in May giving us your comments on the scoping for this document. It started with a Notice of Intent which is published in the Federal Register and notifies everyone, agencies and public alike that we are intending to undertake an EIS process and it also sets the meeting for the public scoping meeting. It sets the dates and times for that.

And so then we followed that with the public scoping meetings that I

mention that were held in May of 2011 and then we take those comments as we prepare the Draft EIS and make our environmental analyses and that can be a somewhat lengthy process as we've discovered.

So where we are right now is in gold up there. The public comment on the Draft EIS. The comment period is mandated to last 45 days and within that period we hold public hearings both here and in Texas. And then we consider those comments when we go to the final EIS and identify our preferred alternative and we come out with a record of decision either for or against funding the project.

So this is a graph of where we are. The opportunities for public involvement was the scoping meeting and the scoping period that happened in May of 2011, and this point right here the comment period for the Draft EIS.

This is a brief schedule of where we are and where we project to be

through the end of 2013. The comment period ends June 25th so if you are submitting comments in writing, please have them postmarked by June 25th. Late comments will be considered to the extent practical as we go forward.

And we're looking at a final EIS, then the 30-day waiting period, and a record of decision late this year. You can provide comments either orally or written today or you can mail comments to me and that's my address up there and it's also on the board in the front if you -- as you came in. My address is in really big letters. I'm not worried about that at all.

And written comments can also be emailed to me at the Leucadia EIS address. That's my alias. I can assess that. Thus far I have not received comments at that address but it's available. And there's also a fax number there if you so choose.

As we go forward tonight, we have pre-registered speakers. We ask

that you keep your comments to five minutes. If you need more than five minutes, we will break and come back to you at the end. Please state your name and organization and speak clearly.

We have a court reporter over here in the corner. She may stop you and ask you to spell your name as needed or provide additional information so that her record is complete. She's creating for us a verbatim transcript of tonight's comments so that we can use them to respond to and include in our documents.

And there are written comment sheets I believe out front. As tempting as it is for us up here to answer your comments and concerns, tonight we're here simply to receive the comments tonight. Just so you know why we're not responding to you if you have a question or a concern.

And with that, I think I'm going to get my official list of

speakers. Okay. If there are no objections, we have the mayor here and he has a short time frame and asked if he could go first. I can see you gentlemen over here have some lengthy comments. Okay. Mr. Roach.

MAYOR RANDY ROACH:

Thank you very much. I didn't intend to jump ahead but I do appreciate the courtesy. I guess since this is being recorded, I have to say my name. My name is Randy Roach, R-O-A-C-H. I'm mayor of the City of Lake Charles and also expecting my fifth grandchild any moment now. That's why I'm sort of in a hurry.

But I do want to just share a few words if I can for the record with respect to this project. I know that you've outlined the nature of the project, the fact that the project has been selected as an eligible project for funding. And so I don't think I need to address the specifics as it relates to the criteria for selection

or the beneficial environmental impact that this would have with respect to the goals and objectives of the program.

I think the concerns, of course, is that it's always expressed or considered in the environmental impact statement is what does it do for the local community. And I think I can say on behalf of the community of Lake Charles, that we do not see an adverse environmental impact effect here in our area. We see this as an advantage for the community. We see this as something that's very beneficial.

Energy is something that we understand here in Southwest Louisiana. We already have LNG in this area. We have refineries. We have petrochemical industries. We have pipelines. We understand how those operations work.

We also understand being in south Louisiana, we also understand pipelines. We understand the permitting process that is intended for

that and we also are aware that the process that is in place now with respect to construction of all of this that we're talking about, not just the facility itself but the pipeline and everything that is related to that has to be done in accordances with the existing rules and regulations. And those rules and regulations were designed and focused at minimizing the adverse environmental impact.

We understand that Leucadia is very comfortable with that. Leucadia has made plans around that. They anticipate that and they support that and their project is based upon what I consider to be a very sound process, not only from the standpoint of its business plan, but also from the standpoint of its objective as an environmental project, but an environmental project that recycles petroleum coke which is a byproduct of the refinery process in which I think is going to be beneficial to this area.

That is produced at the other facilities in this area. This is a convenient way to take that and to use that to convert it into CO2. Take that CO2 and put it in the pipeline and then make some of the existing oil fields that we have around the area, around the nation to be more efficient and to extract as much as we can in order to enhance the energy security of this country.

So we see this as a beneficial project not just for our area but we see this as a beneficial project for the Department of Energy. And of course, we view it as fitting within the overall energy policy of this county to be as energy independent as we possibly can.

MS. FAYISH:

Thank you. And congratulations on that grandbaby.

Mr. Atherton.

MR. ATHERTON:

Good afternoon, Charlie

Atherton. I hate following the mayor. I'm an absolute nobody.

What I wanted to do was understand what the mayor said about the process procedures, requirements, regulations. I come to you from the public's prospective and I very much appreciate you sending me a copy of the EIS which I did go through it till my brain locked up.

And I appreciate the engineer explaining to me, you know, how you took 2.6 million tons and basically make it disappear, you know, in the process. So I appreciate the conversation and the input that I've had from the people here tonight prior to the meeting.

But there are a few things that we would request additional information on and just to make sure you're aware of some issues like -- and I don't live far from the facility. And at one time, I lived a whole lot closer to it. But there is -- I want to --

Public 2-1

I can't minimize the concern of the people that already have -- that live or work down on the east end of Bayou D'Inde Road. There's only one way in and one way out. And through the years, there's been concerns of egress and ingress especially emergency response and that sort of thing.

Right across from the facility the road goes north. There used to be a bridge there. They even talked about, you know, putting the bridge back in a while back. But just to ignore the concern of the safety emergency response ingress/egress at this point it serves the public better to at least make you aware that's an issue and concern. Of course, if we put the bridge back in, it would likely be better.

We would -- and there's also the concern if I read the EIS correctly or understood it. Just cause I read it, doesn't mean that I understood it. So what I say may or may not be within

Public 2-2

the context or even reasonable. But it appeared that if DOE doesn't put money in it then the project won't be built.

It would appear that the project ought to stand on its own financially and then if DOE wants to do their thing, then okay. But for it to be conditional with public money is a concern.

Public 2-3

We also have some small concern that products that are produced by government subsidized plant might cause other plants, you know, maybe in East Texas to shut down or have layoffs or whatever. So when you -- like especially in the methanol products.

Public 2-4

But we also have a concern on something just as simple as an impact on the ship channel. I mean, to the public when you got three LNG facilities that want to do exports and they're all talking about roughly 200 ships a year, that's 600 ships. But that's 600 in to get it and 600 out, and there are only 365 days in the year

and we're always concerned about the ability of our crew ships and other ships and barges that utilize the channel because we don't want to jeopardize our existing facilities for a new guy.

That sounds crude but they've been here forever and they're our backbone and they've got us where we are. So we certainly think that the ship traffic ought to be looked at with the new projected growth because there's supposed to be several billion dollars, you know, worth of maybe 40, 50 billion dollars worth of work that's coming into this area. And I don't know that the EIS has taken all of that into account because this may have become known after the EIS was started.

Public 2-4 cont'd

We also understand that the industrial capture of CO2, we're of the opinion that that actual capture process is unproven technology. And we don't find a detailed explanation of the DOE CO2 capture and sequestration

Public 2-5

Public 2-5 cont'd

requirements and how DOE is going to monitor the compliance. We don't know at what point DOE would pull their funding or at what point they would decide to shut the facility down.

And I guess in short with the public, we would like to a copy of the contract, you know. Exactly what is it they have to do and how are you going to monitor to prove that it's being done. That you actually sequestered whatever the -- whatever the amounts are.

In the EIS, it mentioned a 40-acre site within a mile that hasn't been identified yet. We would like to see that -- wherever that 40-acre laydown yard is for equipment that is going to be used to store methanol and sulfuric acid, we would like to see that identified and possibly an EIS done on that site just like you're doing on this site. You know, it's the unknown that concerns us.

Public 2-6

And we also have the concerns

-- the overall concern is the ozone going into non-attainment. And we're not far from that. And when you have -- I mean, this was a recent article for notification, whatever you want to call it, from the Chamber Southwest, local alliance, whatever you want to call them. I mean, they get down to the weed eaters and lawn mowers. So they're trying to educate the public and the businesses what we can do to stay within compliance.

Public 2-7

And my concern is if we go into compliance, for the most part, all of the area industries and businesses, to my understanding, have done basically what needs to be done to keep us in compliance. And we're concerned with whatever is coming in is going to put us into nonattainment.

So I'm not really willing to see our local industries jeopardized with their ability to operate or to expand because we're in noncompliance of the ozone. So I don't think in my

opinion -- I just don't -- I've read the ozone stuff and the EIS, and I think it deserves further review. And again I appreciate your time and your patient in allowing me to just offer some comments for your consideration and we would like to hear back from you. Thank you.

(Document Submitted, Newspaper Article.)

MS. FAYISH:

Thank you, sir.

Mr. Williams.

MR. WILLIAMS:

My name is John Paul Williams. I am an environmental consultant speaking on behalf of the Gulf Coast Environmental Labor Coalition. The coalition represents the interests of thousands of members and their families from the Gulf Coast area including the vicinity of the proposed Lake Charles gasification plant.

The coalition's goals include support with stringent environmental requirements and encourage economic

growth. Thank you very much for the chance to comment tonight. I appreciate the folks who come here tonight to discuss the project.

I'm referring now to page 4-35 in the Draft Environmental Impact Statement. At that point the Draft Environmental Impact Statement says the mercury will be discharged at 77,000 milligrams per liter. That's two and a half ounces of mercury per liter of discharge water. That's nine ounces of mercury in every gallon of waste water. 1.5 million gallons a day according to the Draft EIS. 800,000 pounds of mercury will be discharged from that facility everyday.

Public 3-1

The same problem with -- the same abrupt and plain miscalculation takes place with regard to copper. Which the Draft EIS at page 4-35 says will discharge 65,000 milligrams per liter. That's literally -- the Draft EIS claims it will be half a million pounds of copper discharged in the

waste water everyday.

These figures deserve an explanation. Either the Draft EIS contains a major error or the plant is permitted to discharge gross and unbelievable amounts of heavy metal into the river. I believe that the Draft EIS is plainly and severely flawed and I am very dismayed that that kind or error would appear in the document and be available to the public for three weeks before a chance to query the experts and have them admit there was a plain flaw in it and yet this document is distributed to the public and paid for with tax dollars.

Public 3-1 Cont'd

And I would ask that the Draft EIS be withdrawn. That the errors poisoned it. That these errors be corrected. A new Draft EIS be issued, and a new comment period commence.

The Draft EIS also refuses to study whether the gasification plant will cause or contribute to the local air pollution problems. The Draft EIS

Public 3-2

Public 3-2 Cont'd

claims the plant would cause an insignificant increase in pollution, but at page 4.6, it shows the plant will increase nitrogen oxide levels by .95 and the significant threshold is just 1. So the plant is within a rounding error of causing a significant impact.

Likewise, sulfur oxide emissions will increase by over 24 when the threshold is just 25. Let's remember this area's air quality is barely legal. The current ozone concentrations are .73 compared with the legal limit of only .75 as an eight hour average. So just a 3 percent increase in air pollution will cause illegal concentrations of ozone in the air which will then cause significant and adverse human-health problems.

Public 3-3

Breaking the ozone limit also makes it much harder for new industry to site here and for existing industries to function.

If the Draft EIS refuse to

Public 3-3 Cont'd

study whether this plant in combination with the many other new smoke-stack industries that have applications pending will cause that 3 percent increase in ozone levels. While the Draft EIS listed some upcoming projects, the list was painfully incomplete, leaving off the Sasol ethylene crackers and four of the new -- the nearby LNG export terminal projects.

And all the Draft EIS did was list those projects without even discussing their cumulative air pollution impacts in combination with the gasification plant. The Draft EIS contained conflicting information about the project's performance and goals.

Public 3-4

The goal of the project is to demonstrate capture of carbon dioxide and the sequestration underground, but the Draft EIS presents many different figures for just how much carbon dioxide the plant will emit from 4 million in the June 2012 announcement

Public 3-4 Cont'd

to 5.2 million tons on page 4.6 to 5.8 million tons on page 2-42.

The Draft EIS claims the plant is designed to capture either 70 percent or 83 percent of the carbon dioxide not saying whether that 70 percent of 5.2 million tons or 83 percent of 5.8 million tons, but it doesn't say how much is actually required to be captured in order to get and keep that 261.4 million in taxpayer money.

The Draft EIS has failed to provide a consistent description of the plant's CO2 emissions, the percentage and tonnages of captured that are possible and percentage and tonnages of captured that are required.

The only existing regulatory document governing carbon dioxide right now is the state air permit and it does not require any carbon dioxide capture at all. This is an important issue because even if the plant performs as designed, it will still allow as much

Public 3-4 Cont'd

carbon dioxide pollution as a medium size power plant. Thank you.

MS. FAYISH:

Jordan Macha.

MS. MACHA:

My name is Jordan Macha. That's M-A-C-H-A and I'm representing the Sierra Club. Thank you for having us out tonight. The Sierra Club represents over 4,000 members statewide, and we have serious revocations about the locating facility and the carbon capture and storage program. And we don't believe that the environmental impacts of the facility have been fully evaluated or disclosed to the public.

Public 4-1

One of our major concerns is the ongoing monitoring of the carbon capture and storage. CCS still has yet to be a proven technology on an industrial scale. Experts in the field indicate that the technology for this type of capture and storage is years away.

Public 4-1 Cont'd

While there are values in saying the efficacy of CCS, that efficacy can only be evaluated if there's rigorous monitoring at every stage of the process including capture at the Lake Charles facility; transportation of the CO2 and the sequestration.

Congress required funds provided by the DOE under this program to be considered on comprehensive monitoring. The Draft EIS fails to adequately outline how DOE plans to conduct monitoring of this project in its entirety.

The Draft EIS -- in the Draft EIS, gives information how the storage of the CO2 in Texas will be monitored but key details about monitoring will be conducted by a third party are incomplete. For example, it is unclear whether that monitoring will last the lifetime of the capture project.

Public 4-2

Oil field sequestration of CO2 is a relatively proven method as

Public 4-2 Cont'd

enhanced oil recovery has been utilized for decades. It is therefore unclear to us why DOE should dedicate scarce federal research funds for this project.

Public 4-3

The Draft EIS also contains insufficient information about who or how the information of capture of carbon from the facility in Louisiana will be monitored. The capture of -- it's imperative that DOE outline to the public how they plan to monitor the capture of CO2 long-term. In the current draft, the language is vague at best.

As Louisiana and the central Gulf Coast for that matter is really the ground zero for the impact of climate change, it's critical that DOE provide details how they plan to monitor the capture of carbon and the ramifications if Leucadia does not meet minimum expectations. Further in the

Public 4-4

Draft EIS, it is unclear how much carbon Leucadia is required to capture

and sequester if any.

So with the monies that are being provided that were provided by Congress for this industrial carbon capture and storage program, there are minimum requirements such as how many limiting of green gases and combating climate change, comprehensive measuring, monitoring and validation, job creation and job recovery promotion.

Public 4-4 Cont'd

Under the guidelines of limiting greenhouse gasses and combating climate change, the Draft EIS fails to fully articulate the net environmental harm.

Public 4-5

The air permit issued by the state currently as it is does not require Leucadia to capture any of its CO2. As described above -- I'm going to submit these.

As I described earlier DOE fails to adequately outline how the capture of CO2 will be monitored, while unspecified company reporting is really

Public 4-6

Public 4-6 Cont'd

not sufficient. Should Leucadia not capture any of its carbon or stop capturing after a certain date, it would be the largest point source of carbon in the state.

The evaluation of climate change impacts in the Draft EIS assumes that the capture system will operate for the lifetime of the project but there is no apparent and forceful requirement for continued operation. This also is a highly speculative project.

Public 4-7

To date, Leucadia has changed its gasification project more than once because it has been unable to find buyers, making job creation and retention uncertain.

Public 4-8

In addition to the production of CO2 not captured or sequestered, the transportation of chemicals and materials used for production, the making of petroleum coke, the transfer of product and the large amount of energy needed to run this facility, and

Public 4-8 Cont'd

the CO2 used for enhanced oil recovery of crude oil which in and of itself is a major source of climate change pollution, discounts the environmental benefits of this project.

Public 4-9

In closing talking about this area, in particular, on Leucadia SynGas and CCS facility will be placed in an area that is already riddled with environmental injustices, former and ongoing.

The communities in this area have been working with EPA for years to address public health and environmental problems that exist in this area.

Public 4-9

The Draft EIS fails to adequately account for the existing environmental justice issues in the surrounding area and does not sufficiently examine the cumulative impacts of the other industrial projects slated for this area.

This includes examining the cumulative impacts of air pollutants and other criteria pollutants that this

Public 4-9 Cont'd

facility will generate and how this will impact the surrounding community.

We thank you for allowing for the public to comment on this product and we urge DOE to provide a more thorough examination and explanation of the measuring and monitoring process of CO2 capture and sequestration at the Lake Charles site.

In addition, further study into the environmental justice impacts to this area is crucial. Louisiana has long been a sacrifice state for this nation but it's time that we comprehensively look at the impacts to the people, and communities and environment of both Louisiana and Texas before funding a risky project with federal funding.

Thank you.

(Document Submitted, Sierra Club.)

MS. FAYISH:

Michael Dees.

MR. DEES:

I'm Michael Dees. I'm here

representing my employer, the Port of Lake Charles, but also myself individually as a member of the community. I was born and raised in the community some 60 years. My father worked for Citgo and produced a lot of petroleum coke in the 30 or 32 years that he worked for Citgo. I worked at Citgo prior to going to school so I'm very familiar with the production of coke and the way it's been handled, worked for the Port of Lake Charles in one capacity or another since 1977.

The port has been a major industry assistance to growth and employment in the area since that time with about 35 different projects totalling about a billion two hundred thousand dollars in investment and thousands of jobs.

Public 5-1

This project by itself will more than double that at about 2.6 billion and represent a tremendous positive investment in the community. It's not been a short-term planning

Public 5-2

effort. I think we started talking about this project at the Port about seven years ago, maybe eight years ago.

At the time when the ideas were being discussed, I thought to myself and later expressed, I think, to the members of the board of the Port and the officials there that in all the 35 years I'd been around in this community, I've never seen a more positive project that was a win, win, win in terms of economic investment, jobs and an assistance to the environment.

No one has mentioned here the fact that petroleum coke will be produced. It's going to be produced. It's been produced for years and years and it's being burned in steel mills and other industries around the world producing pollution. This company has found a way through new technology to capture those pollutants and use them in an economically and environmentally friendly way.

Public 5-3

So based on that, I would just suggest to you that it's a very positive project, not only economically and not only for the Port but also for the environment. And I wish I could adopt Mayor Roach's comments myself.

I only have one grandchild and none on the way that I know of. But he's exactly right in terms of this company wishing to and being required to meet all of the environmental regulations of the state and the federal government.

One key factor, I think that's been missed by some of the opponents is that the project which is located on 70 acres of Port-owned property. I drafted the lease as I've done probably hundreds of times, and not only will the company be mandated by state and federal law to comply with all of the environmental rules and regulations and ensure that they're totally in full compliance with those laws, but the lease itself gives the Port Authority

Public 5-4

Public 5-4

the right to evict them or end the lease if there's any violations. So they put at risk everyday 2.6 billion in investment if they violate any of the environmental regulations.

So I would just suggest that this is a very positive project and the Port of Lake Charles as well as myself are in full support. Thank you.

MS. FAYISH:

Thank you. I'm going to mispronounce this and I apologize. Ann Barilleaux.

MS. BARILLEAUX:

Hi, good evening. I'm Ann Barilleaux and I work for the Southwest Louisiana Economic Developmental Alliance. My last name is B-A-R-I-L-L-E-A-U-X. Our organization does all of the economic development, business retention and workforce development for the five parish region which is: Allen, Beauregard, Jeff Davis, Calcasieu and Cameron parishes.

Public 6-1

And we are very much supportive

Public 6-1 Cont'd

of this project because it will bring great economic development and growth opportunities, not only to Calcasieu Parish, but the affects that have been seen throughout our region. We will have more economic businesses, more jobs for our workers and just growth for our community as a whole.

And one thing I would like to also note that our industries have been working very diligently to make efforts to clean and enhance and really protect the environment, and they provide information for public education as well. And this project is on the technological leading edge of that and that is very important for our community.

MS. FAYISH:

Thank you. Hal McMillin.

MR. MCMILLIN:

Thank you. I'm Hal McMillin, Calcasieu Parish Police Jury, District 14, also a Westlake resident and want to welcome you to Westlake, welcome you

to Southwest Louisiana and I work as business department manager for Levingston Engineers.

If I got up here and first said I love the mayor and ditto everything he said, I would be absolute in that. I'd just like to record all of what he said and just reiterate it, and also in agreement with Mike Dees on that behalf too in what he said.

A lot of great things have been said here tonight and just reiterate the fact that this project is good for Southwest Louisiana. A few things that I'd just like go over that I caught and that I really didn't hear other people say.

Public 7-1

First off, the Calcasieu Parish Police Jury has sent a resolution of support on behalf of this project. We feel as a Police Jury this is a great project for Southwest Louisiana. We know we have been working on this project for a number of years.

Public 7-2

One of the things that Leucadia

Public 7-2

has come to us and done and kind of pledged to us in Southwest Louisiana is to use local contractors and that's very important to use our local contractors. To feed our families right here in Southwest Louisiana that's tremendous. They've come up with this idea. It was their idea and believe me they've stood by this idea.

Public 7-3

I truly believe we have room for growth in Southwest Louisiana. Although we're looking at an opportunity of approximately 40 billion dollars worth of growth in this area. This project here has been on the books for seven years. We're excited about it. A two and a half billion dollar project in Southwest Louisiana is something that's going to be good for our economic development and for our economy.

Public 7-4

I have a lot of faith in our EPA and LDEQ to make sure that this project is safe and clear. I also have a lot of faith in the folks at

Public 7-4 Cont'd

Leucadia. They're going to make sure that our environment is protected. So I'm very happy about this.

The last time to finish up with. Any time that you get matching funds from a federal group and bring it to Southwest Louisiana, I'm thrilled about that opportunity. Please fund this project. Please make this happen in Southwest Louisiana. Thank you very much.

MS. FAYISH:

Thank you. Mr. McMillin was our last registered speaker. If you have additional comments or you would wish to provide written comments, you have the e-mail option and the regular mail option and those addresses are out on the board out front. So I thank y'all for attending.

(Document Submitted, Sign-In Sheet.)

(PUBLIC HEARING CONCLUDED AT 7:55 P.M.)

CERTIFICATE

This certificate is valid only for a transcript accompanied by my seal stamped in blue ink on this certificate.

I, BETTY CURRY MINTON, RPR, CCR, LCR for the State of Louisiana, as the officer before whom this public hearing was taken, do hereby certify that on the 4th day of June 2013, at the Westlake City Hall, 1001 Mulberry Street, Westlake, Louisiana, as hereinbefore set forth in the foregoing pages; that this public hearing was reported by me in stenotype reporting method, was prepared and transcribed by me and is true and correct to the best of my ability and understanding; that the transcript has been prepared in compliance with the transcript format guidelines required by statute and rules of the board, that I have acted in compliance with the prohibition on contractural relationships, as defined by Louisiana Code of Civil Procedure Article 1434 and Rules of the board. I am not related to counsel or to any parties hereto. I am in no manner associated with counsel for any of the

interested parties to this litigation, and I am in no way concerned with the outcome thereof.

This 12th day of June 2013, Lake Charles, Louisiana.

_____

Betty Curry Minton, RPR, CCR, LCR



June 25, 2013

Via email at *LeucadiaEIS@netl.doe.gov.*

Mrs. Pierina N. Fayish
U.S. Department of Energy
National Energy Technology Laboratory
M/S 922–243D
P.O. Box 10940
Pittsburgh, PA 15236

Re: Comments on the Draft Environmental Impact Statement for the Lake Charles Carbon Capture and Sequestration Project (DOE/EIS–0464D)

Dear Mrs. Fayish,

The Department of Energy ("DOE") is proposing to spend over $261 million to support the construction of a carbon capture and sequestration demonstration project at a new petroleum coke gasification facility in Lake Charles, Louisiana. The proposed project will include a carbon capture and compression system, transport of the captured CO_2 several hundred miles west, where it will be injected to enhance recovery of oil resource, and geologically sequester the carbon for some period of time. Although the proposed project will provide an opportunity to test the effectiveness of carbon capture and sequestration technology, it will also support the development of a major new industrial facility in an area of Louisiana already heavily burdened by pollution and the risk of toxic releases.

Sierra Club appreciates the opportunity to offer comments on this very important decision by DOE. Sierra Club has over 2700 members in Louisiana, including many in the Lake Charles area, who are deeply concerned about the impact the Lake Charles Clean Energy Gasification Plant (LCCE Gasification

Plant) will have on the local environment, the health of the area's residents, and global climate change.

Summary of Comments

Public 8-1

The Draft Environmental Impact Statement for the Lake Charles Carbon Capture and Sequestration Project (DEIS) is legally and technically flawed because the project, as described, will not fulfill the stated purpose and need, and the DEIS fails to adequately assess all of the direct, indirect, and cumulative impacts of the project. Among other failures:

- The DEIS fails to thoroughly discuss one of the most critical aspects of the capture and sequestration program—the monitoring of both the captured and stored carbon dioxide (CO_2)—therefore failing to ensure that this project will "demonstrate technologies for the large-scale capture of CO_2 from industrial sources," as required by Congress.
- The climate impacts of the proposed action are not fully acknowledged due to ambiguities in the DEIS about how much carbon will actually be produced, captured, and sequestered.
- The DEIS fails to adequately assess the potential harms from water use, flood risks that accompany this project, and the destruction of wetlands from this project.
- The DEIS fails to adequately address the real and severe environmental injustices already occurring in the Lake Charles community and the cumulative impact of the LCCE Gasification Plant and other existing and future projects will have on this community.
- The DEIS has arbitrarily constrained the alternatives to the proposed project by evaluating only a "no action" alternative, although nothing in the statute creating this demonstration program prohibits the DOE from placing a second request for bids for projects that better match the goals of section 703, namely the mitigation of greenhouse gases from the atmosphere.

I. Introduction

The National Environmental Policy Act (NEPA) is our "basic national charter for protection of the environment." 40 C.F.R. § 1500.1. Congress enacted NEPA "[t]o declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and

welfare of man; [and] to enrich the understanding of the ecological systems and natural resources important to the Nation." 42 U.S.C. § 4321. To accomplish these purposes, NEPA requires all agencies of the federal government to prepare a "detailed statement" that discusses the environmental impacts of, and reasonable alternatives to, all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(C). This statement is commonly known as an environmental impact statement ("EIS"). *See* 40 C.F.R. Part 1502.

The EIS must "provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. § 1502.1. This discussion must include an analysis of "direct effects," which are "caused by the action and occur at the same time and place," as well as "indirect effects, which . . . are later in time or farther removed in distance, but are still reasonably foreseeable." 40 C.F.R. § 1508.8. An EIS must also consider the cumulative impacts of the proposed federal agency action together with past, present and reasonably foreseeable future actions, including all federal and non-federal activities. 40 C.F.R. § 1508.7. Furthermore, an EIS must "[r]igorously explore and objectively evaluate all reasonable alternatives" to the proposed project. 40 C.F.R. § 1502.14(a).

In this case, NEPA requires the DOE to assess all impacts of the Lake Charles Carbon Capture and Sequestration project (Lake Charles CCS project), including any associated energy generation and transmission facilities. 40 C.F.R. §§ 1502.14 & 1502.16. Specifically, the EIS must "present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public." 40 C.F.R. § 1502.14. In order to adequately assess the environmental impacts of the project and of reasonable alternatives to the proposed project (including, but not limited to, the proposed project plus additional mitigation measures), DOE must assess the direct, indirect, and cumulative impacts that the proposed project and each alternative would have. For example, the DEIS must consider:

> [E]nvironmental impacts of the alternatives including the proposed action, any adverse environmental effects which cannot be avoided should the proposal be implemented, the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible or

> irretrievable commitments of resources which would be involved in the proposal should it be implemented.
> . . .
> Possible conflicts between the proposed action and the objectives of Federal, regional, State, and local . . . land use plans, policies and controls for the area concerned.
> . . .
> Energy requirements and conservation potential of various alternatives and mitigation measures. []Natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures . . . [H]istoric and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures.

40 C.F.R. § 1502.16.

Public 8-1 Cont.

Accordingly, the Sierra Club requests that DOE conclude that the Lake Charles CCS project will cause significant and irreparable environmental harm, and reject the project. Alternatively, we request that DOE fully and completely address the following concerns and re-issue the DEIS for further public comment.

II. Without Improved Monitoring, this Project Will Not Fulfill the Stated Purpose and Need nor Statutory Requirements

Under the Energy Independence and Security Act of 2007, Congress directed the DOE to "carry out a program to demonstrate technologies for the large-scale capture of carbon dioxide from industrial resources," 42 U.S.C. § 17251(a)(1), and to conduct large-scale tests to collect and validate data on the feasibility of the commercial use of technologies for geologic containment of CO_2, *id.* § 16293. Demonstrating such technology necessitates a strong monitoring program that will provide data of adequate quality and comprehensiveness, over a long enough period of time, to provide the information needed by decision-makers. The need for a comprehensive monitoring program is recognized by Section 703(a)(2)(C), which requires that the DOE funding only go to an effort that, among other things, "incorporates a comprehensive measurement, monitoring, and validation program." 42 U.S.C. § 17251(a)(2)(C).

The proposed project will capture CO_2 from the gasification process and send it through a new 11.9-mile pipeline to the existing Green Pipeline, "which would

transport the captured CO_2 to oil fields along the Gulf Coast, including the West Hastings oil field in Brazoria County, Texas." DEIS at S-4. To demonstrate the effectiveness of the overall CCS project, there must be comprehensive and rigorous monitoring and reporting at ***every stage*** of the process. The monitoring described in the DEIS falls short of this expectation. There is no information provided about monitoring or reporting for the capture and transportation stages, and the monitoring program for the sequestration stage applies only to one of the sequestration sites and omits key details.

Public 8-2

A comprehensive monitoring plan must include planning, development and implementation. This includes: (1) establishing the goals of the monitoring program, (2) who will collect the data, (3) what data must be acquired in order to meet the established goals, (4) how often this data will be collected, (5) the tools and techniques used for monitoring, (6) the performance standards required to collect accurate data, (7) the use of strong and effective enforcement to ensure the data will be collected and that it will be collected accurately, (8) an action plan if the monitoring is not meeting the established goals, and (9) a reporting plan that establishes the type of data that should be reported, the frequency of the reports, and a mechanism to enforce the reporting plan.

The DEIS fails to lay out any comprehensive monitoring plan and therefore funding the Lake Charles CCS project will not fulfill DOE's statutory requirement to demonstrate technologies for large-scale carbon capture.

A. The Sequestration Monitoring Program Described by the DEIS is Incomplete

Public 8-3

The DEIS states that the goal of the program is to provide "an accurate accounting of approximately 1 million tons of stored CO_2, and a high level of confidence that the CO_2 injected . . . will remain *permanently* sequestered." DEIS at S-4 (emphasis added). However, the DEIS fails to describe any comprehensive program to actually meet this goal.

The current operator of the West Hastings oil field, Denbury Onshore, is already using compressed CO_2 for enhanced oil recovery, and currently monitors that process as needed for commercial and regulatory purposes. The DEIS states that Denbury and the Texas Bureau of Economic Geology would develop and implement a new monitoring program, referred to as the West Hastings Research monitoring, verification and accounting (MVA) Program. DEIS at xxviii.

While the DEIS describes many techniques and tools the MVA program will use to monitor the sequestered CO_2 (*see e.g.*, DEIS at 2-25), it does not establish the length of the monitoring program and the frequency of the monitoring, two details that are critical to demonstrating that a project like the permanent sequestration of 4.6 million tons of CO_2 can successfully be achieved.

Public 8-3 Cont'd

The DEIS fails to provide any hint as to how long the monitoring of the area will continue, including only vague language such as "ongoing" and "continuous." DEIS at 4-22 and S-19. The most definite description of the length of the research activities cited by the DEIS is "over two years." DEIS at 2-26. Where the stated goal is to demonstrate "permanent" sequestration of carbon, this indication that monitoring might last as little as two years raises serious concerns that the purpose of the project will not be fulfilled. Moreover, the indefinite description of the duration of the monitoring period suggests that DOE is not even aware of how long the MVA program will last. Without a commitment to monitor for decades, or evidence that two years of sequestration somehow ensures "permanent" isolation from the atmosphere, the proposed action will be unable to demonstrate the commercial feasibility of sequestration as is statutorily required. 42 U.S.C. § 16293(c)(3)(A).

Furthermore, DOE relies on a statement from Denbury that "a de minimis amount of the CO_2 processed is emitted to the atmosphere," DEIS at 2-22, but it is unclear whether the MVA will involve any monitoring of leakage prior to injection of CO_2. This data gap could seriously undermine the validity of any monitoring results. Finally, it is unclear whether the monitoring will be installed early enough to begin collecting the data necessary to establish baseline conditions. Without solid data regarding the baseline conditions of the aquifer and other geological layers, the resulting analysis may be compromised.

Public 8-4

The sequestration monitoring described in the DEIS is limited to three acres at the West Hastings oil field injection site. Apparently, there are no plans to monitor at any of the other oil fields where CO_2 captured at Lake Charles CCS will be injected. DEIS at S-4. This is a missed opportunity for DOE to assess how well CO_2 is sequestered through EOR in a range of locations, not just at one, hand-selected oil field that may not have representative geological conditions.

B. The DEIS Fails to Describe an Adequate Monitoring Plan for the Capture of CO_2 at the LCCE Gasification Plant or for the CO_2 Pipeline

Public 8-5

Even if the monitoring program described by the DEIS were sufficient to demonstrate that the sequestered CO_2 was permanently stored, the DEIS completely fails to describe the monitoring at the LCCE Gasification Plant. The statute requires monitoring not just of the success of the sequestration stage of the project, but also of the capture stage. *See* 42 U.S.C. § 17251. The entirety of the DEIS discussion on capture monitoring follows:

> Leucadia would provide DOE with information necessary to determine whether the commercial-scale technology operations at the LCCE Gasification Plant are making progress toward the capture and sequestration of 75% of the CO_2 from the treated stream, comprising at least 10% of CO_2 by volume, which would otherwise be emitted to the atmosphere.

DEIS at 2-36, S-15.

Public 8-6

There is no information about how this monitoring will take place, how often the capture monitoring data would be reported to DOE, what "necessary" information the DOE requires, and how the DOE would enforce the provision of information if Leucadia fails to follow through. Nor is it apparent that Leucadia or the vendors of the equipment used in the capture and compression processes would not consider capture rate, cost, and operational information to be proprietary, and withhold it from the public.

A fair reading of the DEIS suggests that the Lake Charles CCS project is completely lacking a comprehensive monitoring plan and therefore cannot demonstrate the large-scale capture of CO_2.

Public 8-7

Similarly, the DEIS give little to no attention to monitoring the transport of CO_2 through several hundred miles of pipeline. According to the DEIS, Denbury will monitor the pressure in the pipeline, DEIS at 2-19, but it is unclear whether the results of this monitoring will be reported to DOE, or whether the quality and sensitivity of the data produced through Denbury's monitoring, which is presumably undertaken for operational and safety purposes, is adequate for the research and verification standards established by Congress.

The transmission of millions of tons of CO_2 over hundreds of miles is a critically important aspect of the Lake Charles CCS project and has the potential to

Public 8-7 Cont'd

release millions of tons of CO_2 into the atmosphere. Therefore, like the LCCE Gasification Plant and the EOR sequestration sites, there must be a comprehensive monitoring plan in place for the pipeline.

Without a comprehensive description of the monitoring plan the public cannot be accurately informed of the project's effectiveness. It must therefore be assumed that there is in fact is no comprehensive monitoring plan for this project and it will violate its statutory mandate to demonstrate the large-scale capture of CO_2.

III. The DEIS Fails to Evaluate Indirect Effects of Enhanced Oil Recovery Operations in Texas

A properly prepared EIS must include an analysis of "direct effects," which are "caused by the action and occur at the same time and place," as well as "indirect effects, which . . . are later in time or farther removed in distance, but are still reasonably foreseeable." 40 C.F.R. § 1508.8.

Public 8-8

The DEIS appropriately considers the LCCE Gasification Plant to be a connected action. In contrast, the DEIS considers the enhanced oil recovery activities at West Hastings and elsewhere on the Texas Gulf Coast *not* to be within the scope of the DEIS because that oil recovery would occur regardless of this project. DEIS at 1-6. However, by funding the Lake Charles CCS project, DOE is creating a significant new source of pure, compressed CO_2 that is suitable for enhanced oil recovery, a resource that is otherwise obtained by drilling into natural formations such as the Jackson Dome. This project also involves the construction of a new CO_2 pipeline that will connect the ICCS Gasification Plant and other industrial sources of CO_2 in Louisiana to an existing CO_2 pipeline.

According to a 2010 DOE report on carbon dioxide EOR, "the single largest project cost [for EOR] is the purchase of CO_2," and "[t]otal CO_2 costs . . . can amount to 25 to 50 percent of the cost per barrel of oil produced."[1] This report states that reducing the costs of CO_2 and providing a definite supply would improve the "economic margin essential for justifying this oil recovery option to operators who still see it as bearing significant risk."[2]

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[1] *See* DOE National Energy Technology Laboratory, *Carbon Dioxide Enhanced Oil Recovery* (Mar. 2010) at 13, available at http://www.netl.doe.gov/technologies/oil-gas/publications/EP/CO2_EOR_Primer.pdf and attached as Exhibit 1.

[2] *Id.*

Public 8-8 Cont'd

Undeniably then, this project is expanding the supply of compressed, pure CO_2 and providing new infrastructure that will ensure continued supply, which will make it more economical for Denbury Onshore and other oil field operators to undertake enhanced oil recovery. Therefore, the effects of any EOR activity undertaken with CO2 captured at the LCCE Gasification Plant, or transported through the new 11.9 mile pipeline, must be considered in a revised and reissued EIS.

IV. The DEIS Fails to Accurately Address the Impacts this Project will have on Climate Change

Public 8-9

The Lakes Charles CCS project is enabling the construction of a major new industrial source which, "operating at full capacity, is permitted to emit 5,840,387 tpy of CO_2 equivalents (CO2e) per year."[3] DEIS at 5-19. The DEIS asserts that there will be minimal climate impacts because 89% of the CO_2 produced by the project will be captured, DEIS at 5-18, but this analysis is inadequate and misleading. The DEIS fails to accurately describe the amount of CO_2 that this project will produce, the potential implications from less than 89% capture, and the cumulative impacts the project will have on climate change.

A. The DEIS Fails to Account for All of the Potential Sources of CO_2 Emissions from the Lake Charles CCS Project

Public 8-10

The DEIS asserts that 89% of the CO_2 produced will be captured, but does not describe what activities the DOE counted toward the project's CO_2 emissions. Even if the CCS project successfully captured 89% of the gasification process stream, there are many other sources of carbon emissions associated with this project. This is a significant defect of the DEIS considering the fundamental purpose of the project and DOE's statutory authority for providing financial incentives.

The DEIS states that the plant is permitted to release over 5.84 million tons of CO_2 annually at full capacity. DEIS at 5-19. The DEIS notes that emissions from diesel tugs used to bring in petroleum coke would be responsible for another 5,000 tons per year. *Id.* Yet, the DEIS apparently does not account for any of the other CO_2 emissions associated with this complex project, such as:

[3] For the sake of simplicity, these comments use the term CO_2 to refer to CO_2e and other greenhouse gas emissions.

Public 8-10 Cont'd

- Burning the 175 gallons of fuel per day that the DEIS estimates will be used for vehicles and equipment at the facility. DEIS at 2-37.
- Moving the 8-10 trucks and the 6-8 railcars needed every day to ship the methanol that will be produced by the LCCE Gasification Plant. *Id.*
- The 10-30 barges needed every month to ship the methanol to be produced. *Id.*
- The 80 MW of electricity that will be needed continuously to power the gasification process. *Id.* Leucadia will purchase this electricity from Entergy (DEIS at 2-38), and 100% of Entergy's baseload generating assets in Louisiana are coal-fired.[4] Sierra Club estimates that this additional load requirement will result in emission of *753,360 tons* of CO_2 per year from the electricity consumed.[5] That is approximately a 13% increase in CO_2 emissions over the 5.8 million tons that DOE acknowledges.
- The production of the 5,500 gallons of ammonia (DEIS at 2-37), which is highly energy intensive, the plant will use every day for control of nitrogen oxides.[6]

Additionally, it is not clear whether the estimated 80 MW of energy needed for the facility includes the energy needed to transport the CO_2 from Lake Charles to the West Hastings Oil Field, over 200 miles away, or if that would require additional energy and therefore generate further CO_2 emissions. If not, DOE must add these to the CO_2 emissions that will be released as a result of this action, and analyze their impact on the climate.

Public 8-11

In addition to the activities mentioned above, which generate CO_2 emissions at the LCCE Gasification Plant itself, there are two major sources of CO_2 emissions associated with the overall project that the DEIS failed to analyze at all—the downstream emissions associated with the products and byproducts of gasification.

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[4] Entergy Corporation, *Utility Fossil/Renewable Generating Assets* (2012), available at http://www.entergy.com/operations_information/generation_portfolio.aspx and attached as Exhibit 2. To estimate the carbon emissions associated with the electricity that Leucadia will receive from Entergy, we assumed that all of the electricity would be generated by Entergy's baseload plants located in the state.

[5] 80 MW = 700,800 MWh = 700,800,000 kWh. 700,800,000 kWh * 2.15 CO_2 per kWh = 1,506,720,000 pounds per kWh. 1,506,720,000 kWh/2000 = 753,360 tons of carbon. We used the U.S. Energy Information Administration's conversion factor for sub-bituminous coal (2.15 pounds CO_2 per kWh).

[6] International Fertilizer Industry Association, *Energy Efficiency and CO_2 Emissions in Ammonia Production* (2009), available at http://www.fertilizer.org/ifa/HomePage/LIBRARY/Publication-database.html/Energy-Efficiency-and-CO2-Emissions-in-Ammonia-Production.html and attached as Exhibit 3.

Public 8-11 Cont'd

First, the LCCE Gasification Plant's main purpose is to produce methanol. The DEIS does not discuss what will be done with the methanol produced at the LCCE Gasification Plant, and it is possible that the end use of this product is not yet known to Leucadia. Because of the possibility that the methanol will be combusted for electricity or as a transportation fuel,[7] the DEIS should evaluate the CO_2 and other environmental impacts of the product of the LCCE Gasification Plant being used as a fuel.

Public 8-12

Second, the DEIS fails to consider the CO_2 that will be emitted from burning the oil that will be recovered from the West Hastings Oil Field and other EOR operations. The amount of oil that will be recovered using CO_2 captured at the LCCE Gasification plant is not estimated in the DEIS. At just the West Hastings field, Denbury estimates that it could recover 60-90 million more barrels of oil that it previously could not have recovered from this and other EOR projects. DEIS at 2-22. If 90 million barrels were recovered and burned, almost 380 million more tons of CO_2 would be released into the atmosphere.[8] As discussed above, the impacts of EOR activity are indirect effects of the proposed action and must be evaluated as part of the project's overall impact. The assertion in the DEIS that the EOR operations, including injection rates and production volumes, will not change in the slightest due to the proposed action is simply not supportable.

Public 8-12a

It seems very likely that the CO_2 to be generated from burning the methanol and oil from this project will negate the climate benefits of capturing carbon produced in the gasification process. The fact that the DEIS fails to acknowledge these additional sources of CO_2 emissions as impacts related to the project is highly problematic. The DEIS's omission of these CO_2 emissions defeats the very purpose of NEPA: to inform the public and decision-makers of the environmental consequences of a proposed action.

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[7] Martin Halmann & Meyer Steinberg, GREENHOUSE GAS CARBON DIOXIDE MITIGATION: SCIENCE AND TECHNOLOGY 245 (1999).

[8] U.S. Environmental Protection Agency, *Calculations and References: Barrels of Oil Consumed* (2009) available at http://www.epa.gov/cleanenergy/energy-resources/refs.html and attached as Exhibit 4.

B. The Climate Impact Analysis in the DEIS Incorrectly Assumes that the Capture System Will Work at Full Capacity for the Lifetime of the Source

Public 8-13

A critical flaw with the DEIS analysis is its assumption that 89% of the CO_2 produced at the Lake Charles Plant will be captured and sequestered. DEIS at 5-19. This assumption is unsupportable for several reasons.

First, there is no enforceable requirement for the facility to capture any CO_2 at all. *Id.* If the capture system does not work as planned, or the demand for compressed CO_2 declines precipitously, Leucadia could apparently vent its CO_2 stream to the atmosphere after passing it through the regenerative thermal oxidizer. If recipients of these DOE funds must operate the capture system for a minimum period of operation as a condition of receiving federal funds, it is not evident from the DEIS.

Second, although 89% capture is the goal of the project, the DEIS recognizes that the actual capture rate could be lower. DEIS at S-15. This would be a disappointing result of the demonstration project, but more critically, would mean significantly higher volumes of CO_2 being emitted. The DEIS must evaluate the climate implications of zero percent capture.

Public 8-14

Finally, without any basis, the DEIS reports that demand for the CO_2 at the sequestration site is expected to last for the life of the facility, 30 years, DEIS at 2-36, but then states that sequestration might last only for the duration of the demand for CO_2 to be used in EOR in the region. *Id.* The DEIS does not evaluate the climate implications if demand for CO_2 does dry up, either at the West Hastings Oil Field or elsewhere in the region. *Id.* Without a market for the compressed CO_2, Leucadia would have to vent its captured CO_2 stream. The consequence would be the addition of a major new source of CO_2 emissions— one of the largest in the state of Louisiana (DEIS at 5-19)—operating for another several decades with no mitigating capture and sequestration.

Despite all of the uncertainties related to the actual capture and sequestration of CO_2 in this project, the DEIS does not contemplate the potential climate impacts if the project fails to sequester 89% of the CO_2 produced. The DEIS must analyze the climate impacts if the facility is capturing less than 89% of its estimated CO_2 production, including the impact of no carbon capture at all.

C. The DEIS Fails to Acknowledge That Most of Carbon Captured May Not Be Sequestered

Public 8-15

DOE asserts that the Lake Charles CCS project "would capture and geologically store approximately 4.6 million metric tons per year of CO_2 that would otherwise be emitted to the atmosphere." DEIS at S-37. Based on other statements in the DEIS, however, this statement is misleading or at least unsubstantiated. The DEIS notes that only approximately 1 million tons would be monitored at the West Hastings oil field. DEIS at S-4, 1-3.[9] Thus, it appears that there are no plans to monitor 3.6 million tons of CO_2, or 78% of the CO_2 that the project plans to capture. It is not even clear where, or if at all, this remaining CO_2 would be sequestered.

The absence of plans to sequester, or monitor the sequestration of 3.6 million tons of CO_2 should be made explicit in the DEIS. DOE's references to 89% capture of CO_2 are misleading absent reassurances about how this significant amount of CO_2 will be handled. Finally, the DEIS must evaluate the climate impacts of the 3.6 million tons that are not sequestered or monitored, rather than assuming 89% capture in its analysis. *See* DEIS at 5-9.

D. The DEIS Must Examine the Effects of this Facility on Climate Change

Regardless of whether this facility ultimately captures and sequesters 89% of its CO_2 emissions, the DEIS has failed to fairly examine the effect it will have on climate change.

Public 8-16

Immediately after DOE explains that climate change is a cumulative event and that the reduction of greenhouse gases (GHGs) will be necessary to mitigate the harms of climate change, the DOE concludes that the "emissions of GHGs from the LCCE Gasification Plant by themselves would not have a direct impact on the environment in the proposed plant's vicinity; neither would these emissions by themselves cause appreciable global warming that would lead to climate changes." DEIS at 5-21 to 5-22. These conclusory statements fall desperately short of sufficient NEPA analysis. *See* 40 C.F.R. § 1508.7 (an agency must assess the "impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions"); *Ocean Advocates v. U.S. Army Corps of Eng'rs.*,

[9] The MVA would also assess the sequestration of another 1 million tons of CO_2 by Air Products, but that CO_2 is generated through a different project. DEIS at 1-3.

402 F.3d 846, 868 (9th Cir. 2005) ("[g]eneral statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided" and the analysis "must be more than perfunctory; it must provide 'a useful analysis of the cumulative impacts of past, present, and future projects'")(citations omitted).

Public 8-16 Cont'd

Aside from stating the Lake Charles facility will emit GHGs, DOE provides no analysis of the cumulative effects of GHG emissions vis-à-vis climate change, despite clearly being aware that climate change is a cumulative phenomenon that will require a reduction rather than small addition of emissions.

DOE also states there is "no methodology that would allow DOE to estimate the specific impacts (if any) this increment of warming would produce in the vicinity of the plant or elsewhere." DEIS at 5-22. This statement too, falls short of the requirements under NEPA. The inability to estimate the specific impacts is not an excuse for failing "to estimate what those effects might be before irrevocably committing to the activity." *Conner v. Burford*, 848 F.2d 1441, 1450 (9th Cir. 1988). Inherent uncertainties regarding climate change do not allow DOE to "shirk [its] responsibilities under NEPA." *Kern v. U.S. Bureau of Land Mgmt.,* 284 F.3d 1062, 1072 (9th Cir. 2002) (quoting *Save Our Ecosystems v. Clark,* 747 F.2d 1240, 1246 n.9 (9th Cir. 1984)); *cf. Natural Res. Def. Council v. Kempthorne*, 506 F. Supp. 2d 322, 369 (E.D. Cal. 2007) (rejecting agency position characterizing global warming's effects to endangered fish as speculation or "sheer guesswork").

NEPA Section 102(F) requires that the federal government "recognize the worldwide and long-range character of environmental problems." 42 U.S.C. § 4332(F). This includes global climate change. DOE states that stabilizing atmospheric concentrations of GHGs will require societies to reduce their annual emissions (DEIS at 5-22) – and the construction of facilities that will produce or recover high-carbon fuels like methanol and oil will not accomplish this task.

Public 8-17

The DOE also failed to assess the impacts of global warming pollution on different environmental receptors such as wildlife, vegetation, water resources, humans, and land. DOE should pay particular attention to the impact of global warming on Louisiana, a coastal state that is especially vulnerable to rising sea levels and more intense tropical storms. Climate change is affecting the intensity of

Atlantic hurricanes, and hurricane damage will likely continue to increase because of climate change.[10]

The DEIS has failed to fully and fairly address the real impacts this project will have on climate change. It has conveyed misleading and confusing numbers on the emissions that can be expected from this project, it has failed to analyze the very real possibility that 89% of the CO_2 emitted will not be captured, either initially or several years into the project, and it has ignored its duty under NEPA to recognize that the emissions from this project will actually affect climate change. The DEIS is fatally flawed without a discussion of these critical issues; therefore DOE must revise the DEIS and open another round of public comment.

V. Direct Environmental Consequences and Human Impacts

A. The DEIS Fails to Accurately Assess the Impacts of this Project on Environmental Justice Communities

1. Louisiana

The DEIS claims that the LCCE Gasification Plan will have no environmental justice impacts. DEIS at 4-85. DOE representatives must never have visited the Lake Charles area, which is home to 53 petrochemical plants and dozens of industrial facilities and situated in Calcasieu Parish, one of the 100 top counties in the nation for toxic air emissions health effects.[11]

Public 8-18

The DEIS arbitrarily analyzes a one-mile radius around the facility for environmental justice effects. DEIS at 3-78. The decision to analyze only a one-mile radius around the facility frames out of the analysis the paradigmatic environmental justice community of Mossville, just two miles from the LCCE

[10] James B. Elsner, *Evidence in Support of Climate Change- Atlantic Hurricane Hypothesis,* 33 GEOPHYSICAL RESEARCH LETTERS L16705 (2006) (attached as Exhibit 5). A press release regarding this study is available at http://www.agu.org/news/press/pr_archives/2006/prrl0629.html and attached as Exhibit 6.

[11] *See* Mossville Environmental Action Now, Inc. et al., *Breathing Poison: The Toxic Costs of Industries in Calcasieu Parish, Louisiana* (2009), *at*, Table 2-D (attached as Exhibit 7); Mossville Environmental Action Now, Inc et al., *Industrial Sources of Dioxin Poisoning in Mossville, Louisiana: A Report Based on the Government's Own Data* (2007) at 20, n.1, available at http://www.loe.org/images/content/100423/mossville.pdf and attached as Exhibit 8. *See also* Mossville Environmental Action Now at http://meannow.wordpress.com/ (last visited June 24, 2013).

Public 8-18 Cont'd

Gasification Plant site.[12] Mossville was founded by African Americans in the 1790s.[13] Today its population is largely African American[14] and low-income individuals,[15] and it residents have been fighting for environmental justice for years.[16]

Public 8-19 Comment Noted

Many Mossville residents believe their health and the health of their neighbors have been severely harmed from the toxic emissions from the facilities surrounding their home.[17] Indeed, there is much evidence tending to show the harm of these facilities on Mossville's residents. For example, cancer mortality rates for black males are higher in Calcasieu Parish than in any other parish in the State, and a small sample of 28 Mossville residents showed their blood to have an average of three times the amount of the toxic chemical dioxin than the comparison group.[18]

Mossville is surrounded by 14 chemical plants, including Conoco Phillips, an oil refinery and Georgia Gulf, a vinyl chloride factory.[19] Only one of these fourteen plants, Sasol, is so much as mentioned in the DEIS. DEIS at 5-6. The DEIS mentions other industrial plants in the area including a Citgo Refinery, the City of Sulphur's wastewater treatment plant, and Halliburton Energy Services, but without any discussion of the cumulative impact of another major industrial complex to this community already burdened by pollution and the risk of catastrophic industrial accidents. *See* DEIS at 2-2. In fact, facilities in this area are already releasing huge amounts of several chemicals that will be stored on the LCCE Gasification Plant site, including ammonia, methanol, and chlorine.[20]

Public 8-20

The LCCE Gasification plant will involve the storage of 3.3 million gallons of sulfuric acid and 9.6 million gallons of methanol onsite, along with many other chemicals.[21] Another 3.8 million gallons of sulfuric acid and 3.0 million gallons of

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[12] *See* e.g., David S. Martin, *Toxic Town: People of Mossville 'are like an experiment*,' CNN NEWS, Feb. 26, 2010, available at http://www.cnn.com/2010/HEALTH/02/26/toxic.town.mossville.epa/index.html and attached as Exhibit 9.
[13] *Id.*
[14] *Id.*
[15] Ex. 7, Chapter Three.
[16] See e.g., Jeannine Cahill-Jackson, *Mossville Environmental Action Now v. United States: Is a Solution to Environmental Injustice Unfolding?* 3 PACE INT'L L. REV. ONLINE COMPANION 173 (2012) (attached as Exhibit 10).
[17] Ex. 9
[18] Ex. 7 at 3.3 and 3.4
[19] Ex. 9, Ex. 7 at Table 1-A.
[20] Ex. 7 at Table B-2.
[21] *See* DEIS at S-7.

methanol will be stored off-site on a parcel of land that has not yet been identified. DEIS at S-8. That parcel of land could be even closer to residences, schools, and parks. All of these chemicals will be stored in an area that is extremely vulnerable to hurricanes, and indeed has previously been destroyed by hurricanes. DEIS at 3-53. Despite recognizing the potential for natural disasters in the Gulf Coast region, the DEIS fails to discuss the implications these disasters could have on the surrounding community if the extremely hazardous materials stored on the proposed site were to be released.

Public 8-21

The DEIS's failure to even mention Mossville, which is just two miles away from the proposed facility, is extremely misleading. From reading the DEIS, the public would not be made aware that DOE is proposing to make possible the development of a major new industrial facility so close to a community already burdened by pollution.

Public 8-18 Cont'd

The Memorandum of Understanding on Environmental Justice and Executive Order 12898, which was recently affirmed by President Obama, requires DOE to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Exec. Order No. 12898, 59 Fed. Reg. 7629 (Feb. 11, 1994). The fact that the DEIS fails to even recognize that a minority and low-income population that has been ravaged by adverse health affects from industrial plants exists in the area, shows the extent to which DOE has violated the requirement under this order.

In order to fulfill the Executive Order requirements, the DEIS must thoroughly discuss the Mossville community, taking into account the petrochemical and industrial plants already operating in the area and their emissions, the health and environmental harms the Lake Charles area already suffers from because of the existing petrochemical and industrial facilities in the area, and the harms they could suffer in the future from the cumulative effects of the existing facilities and the LCCE Gasification Plant together.

2. Texas

Public 8-22

As it did at the LCCE Gasification Plant site, the DEIS arbitrarily confines the scope of its environmental justice analysis to a one-mile radius around the West Hastings Oil Field. DEIS at 3-82. However, unlike the Lake Charles area, DOE does

find that there is an environmental justice area in that one-mile radius. DEIS at 3-83. In fact, nearly half of the population in the one-mile radius around the proposed MVA research site is Hispanic. DEIS at 3-82. All census tracts included in the DOE's study had higher poverty rates and/or minority rates than the rest of the cities, county and state in which they were located: Alvin, Texas, and Pearland, Texas in Brazoria County. DEIS at 3-83.

Public 8-22 Cont'd

Although the DEIS acknowledges this, it fails to analyze any potential environmental justice impacts of the EOR, because it considers impacts from the MVA research project—not the underlying EOR operations. The DEIS determines that any impacts from monitoring activity would be minor, and therefore finds that there would be no disproportionate impacts on minority or low-income residents. DEIS at 4-90 to 4-91. As explained above, by increasing the supply of and infrastructure for CO_2 suitable for EOR, this project is increasing the likelihood that EOR operations will continue or expand at West Hastings and other oil fields in the region. Therefore, the environmental effects of EOR activity must be considered in connection with this project.

Public 8-23

Recovering oil has known negative effects on the air quality, including the emission of ozone forming VOCs.[22] These operations are taking place in the Houston-Galveston air quality region, one of the worst non-attainment regions in the country for ozone.[23] The DEIS must fully analyze the impact these EOR activities will have on the surrounding air quality and the harm to Alvin and Pearland communities, who have already suffered their fair share of ozone pollution from the West Hastings Oil Field and other industrial activities.

B. The DEIS Fails to Adequately Assess the LCCE Gasification Plant's Water Usage

Leucadia has contracted with the Sabine River Authority to purchase 12.2 million gallons per day of water from the Sabine River. DEIS at 4-34. Assuming year-round operation of the LCCE Gasification Plant, this adds up to around 4.45

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[22] U.S. Environmental Protection Agency, *Reducing Air Pollution from the Oil and Gas Industry: EPA's Final New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants* (Apr. 17 2012) at 3, available at http://www.epa.gov/airquality/oilandgas/pdfs/20120417presentation.pdf and attached as Exhibit 11.

[23] Texas Commission on Environmental Quality, *Houston-Galveston-Brazoria: Current Attainment Status* (2013), available at http://www.tceq.texas.gov/airquality/sip/hgb/hgb-status and attached as Exhibit 12.

billion gallons of water, or over 13,500 acre feet, a significant amount of water even in state as blessed with water as Louisiana.[24]

Public 8-24

The DEIS concludes without further discussion that because the large volume of water the plant will use is currently available and because the Sabine Diversion Canal's purpose is to supply water for industrial consumers, construction of the plant would have no or negligible effect on water availability or local water use. DEIS at 4-34. Simply citing the large storage volume of Toledo Bend Reservoir provides no reassurance that this major new demand will not strain local water supplies, since the DEIS presents no information concerning other demands on the water in Toledo Bend. In Table S-4 (DEIS at S-38), DOE acknowledges other likely future industrial projects for the Lake Charles area, but does not evaluate the water demands imposed by these facilities in conjunction with the LCCE Gasification Plant.

Public 8-25

Nor did the DEIS analyze the potential for drought and the impact the project's water usage could have on water availability in the region. The 2010 Sabine River Authority Hazard Mitigation Plan states that in each of the last 10 years almost 15 weeks of drought occurred and assesses the risk for future drought as high.[25] Between 1997 and 2008 20 drought impacts to agriculture were reported.[26] These impacts included devastating losses of crops and in some cases livestock, and the economic losses have been substantial.[27] In east Texas, customers of the Sabine River Water Authority had water restrictions from droughts in 2011.[28]

The 12.2 million gallons of water that Leucadia plans to use each day from the Sabine River is a substantial amount of water from a river that just two years ago was not able to meet demand. Despite recognizing that climate change will increase the potential for drought (DEIS at 5-20), the DEIS fails to even consider the possibility of drought in its assessment of water availability. The DEIS must analyze the potential impact on water availability the LCCE Gasification Plant will have when drought returns to the Sabine again.

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[24] We estimated annual usage in terms of gallons and acre-feet by assuming 12.2 million gallons per day, for 365 days, and the dividing by 436,000 (number of gallons in an acre foot of water).
[25] Sabine River Authority, *Hazard Mitigation Plan* (Jan. 2010) at p. 31, available at http://www.srala-toledo.com/ and attached as Exhibit 13.
[26] *Id.* at 29.
[27] *Id.* at 29-30.
[28] Texas Water Resources Institute, *Drought Perspectives: Sabine River Authority of Texas* (2012), available at http://twri.tamu.edu/publications/drought/2012/march/drought-perspectives/ and attached as Exhibit 14.

C. The DEIS Does Not Fully and Fairly Analyze the Impacts on the Floodplain

The DEIS fails to adequately analyze whether construction of the LCCE Gasification Plant and offsite storage area will impact floodplain drainage and therefore increase the chance of flooding in the area. DEIS at 4-26. Floodplain drainage is particularly critical because of the Lake Charles area's high vulnerability to flooding.[29]

Public 8-26

The DEIS skirts this topic because the Calcasieu Parish Police Jury Division of Engineering and Public Works issued a waiver for the drainage assessment. DEIS at 4-26. The DEIS does not state the basis for this waiver being issued—yet concludes that "construction of the site . . . would not increase the potential for floods." *Id.* Waivers of this nature can be granted for any number of reasons, and it is not apparent that this waiver was granted because the development of this 70-acre riverfront site requiring fill of over 26 acres of wetlands and elevation of the project site above the floodplain will have no flooding impact whatsoever.

The DEIS must either indicate that a determination was made as part of the waiver process that there would be no impact, or it must assess the flood impact the facility will have. The purpose of NEPA is to inform the public and decision-makers about a project's environmental impact. Even with a local waiver, there may still be an impact on the floodplain and therefore the DEIS must analyze this impact.

D. The DEIS Fails to Adequately Analyze the Harms to Wetlands

The DEIS recognizes that the LCCE Gasification Plant alone would impact 26.2 acres of forested and emergent marsh wetlands. DEIS App. E, at 8. The DEIS seeks to reassure the public that mitigation was required in connection with the Section 404 permit for that wetland fill, but provides no information about that mitigation, other than stating that it took place "through an agreement" of involved parties. *See id.* Such a broad statement does not adequately inform the public about impacts to this vital and vanishing resource.

Public 8-27

Wetlands provide critical protection from flood waters and are a huge asset to Louisiana's recreational and agricultural interests as well as the interests of the

Public 8-28

[29] Ex. 13 at 57.

seafood industry.[30] The Louisiana wetlands are extremely fragile and face huge losses every year.[31] For this reason, mitigation must be very carefully designed and implemented where any wetland destruction is permitted. There are real environmental, economic, and cultural impacts if wetland mitigation is done incorrectly. The DEIS provides none of the basic facts that would establish a proper mitigation plan. It is critical that the public be informed where the mitigation took place, whether the mitigation wetlands will be properly monitored, and whether the mitigation wetlands are of the same kind as the wetlands that were lost, and therefore will provide the same habitat and ecosystem services.

Public 8-28 Cont'd

E. The DEIS Failed to Adequately Address Impacts on Protected Species

The DEIS's analysis of the Lake Charles CCS project minimizes what may be serious impacts to protected species. Section 7(a)(2) of the Endangered Species Act requires DOE to consult with the Fish and Wildlife Service (FWS) to "insure that any action authorized, funded, or carried out by [the] agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species." 16 U.S.C. § 1536(a)(2). It does not appear that DOE has yet received the concurrence of the FWS in its assessment that the project will have no impact on protected species.

Public 8-29

The DEIS's evaluation of impacts to wildlife also rests on the determination of the state Department of Wildlife and Fisheries that there would be no impacts to rare or threatened species, However, its analysis was purely based on a database compiled by the Louisiana Natural Heritage Program.[32] A compilation of data on species is hardly enough to insure that any action the DOE takes here is not likely to jeopardize the continued existence of any endangered or threatened species. Indeed, the letter includes a disclaimer that states, "[i]n most cases, this information is not the result of comprehensive or site-specific field surveys . . . nor should they be substituted for on-site surveys required for environmental assessment." DEIS App. C. Unfortunately, it seems that DOE ignored this disclaimer and proceeded to rely on the cursory assessment done by the state FWS.

Public 8-30

[30] U.S. Geological Survey, *Louisiana Coastal Wetlands: A Resource at Risk* (2013), available at http://pubs.usgs.gov/fs/la-wetlands/ and attached as Exhibit 15.
[31] *Id.*
[32] *See* DEIS Appendix C, Letter from Gary Lester, Dept. of Wildlife and Fisheries, to Lawrence R. Leib, May 28, 2009.

Public 8-31

According to the U.S. Fish and Wildlife Services, some of these protected species include the red-cockaded woodpecker, the bald eagle, the Louisiana Black Bear (DEIS at 3-48), and the Old Prairie crawfish, *id.* at 4-60. Despite recognizing that these species could be present near project sites, the DEIS concludes without any basis that disturbances from construction would be temporary and minor. DEIS at 4-58. Construction that disrupts a single breeding or rearing season can be highly detrimental to a vulnerable species.

Public 8-32

The DEIS also determined that the harm would be minor because the majority of resident species have the ability to relocate. DEIS at 4-58. This casual assumption that other appropriate habitat is available is not supported by any analysis, such as whether that remaining habitat can support an increased concentration of a particular species, whether relocation would result in increased exposure to predation or manmade threats such as vehicle traffic, whether there are safe corridors of travel to the other habitat. Nor does the DEIS acknowledge that new oil and gas pipelines and other infrastructure are being built all over the Gulf Coast region, likely restricting the quality of the presumed alternative habitat for wildlife displaced by the project's CO_2 pipeline. Cumulative impact analysis is essential in these situations and completely absent from this DEIS.

Public 8-31 Cont'd

The DEIS must explain why it finds that the impact would be minor and discuss the impacts on the minority of species that could not relocate, because they were breeding, or for any other reason. This is especially important for the red-cockaded woodpecker and bald eagle. The DEIS notes that both of these animals could be found in undeveloped forested areas and wetlands adjacent to the proposed pipeline routes and then later notes that species in exactly these areas could be affected by noise and be dislocated, but does not discuss the impacts on these endangered species. DEIS at 4-58.

Regardless of whether individual members of species are identified in the project vicinity, DOE must consider whether the habitat being affected may be identified as critical to survival or recovery of any of the species known to exist in the general vicinity. *See* 16 U.S.C. § 1536(a)(2) (federal agencies are required, for all discretionary activities, to "insure" that its actions neither "jeopardize the continued existence" of any of the nation's listed species nor "result in the destruction or adverse modification" of listed species' critical habitat).

Public 8-33

The inquiry into the potential harm to protected species at the site of the West Hastings Oil Field is also inadequate. The DEIS lists several federal and State

endangered and threatened species that are known to occur or could occur within the area but does not even discuss all of the species in its analysis. DEIS at 3-49 to 3-50. The DEIS does mention that the Texas horned lizard, a State threatened or endangered species, has a moderate likelihood of occurring on the West Hastings Field Oil site, but then omits any analysis of potential impacts to the species. DEIS at 3-50.

Public 8-33 Cont'd

With respect to more than a dozen imperiled plant species, the DEIS summarily concludes that these are not likely to be present on the site due to grazing and oil production—it is obvious that no site surveys have been conducted. *Id.* The DEIS is also dismissive of the possible use of this area as habitat during butterfly migration, because the insects would be there only "transiently." *Id.* This sparse analysis ignores that the adjacent coastal prairie habitat is also highly impacted by oil and gas development, which represents a massive cumulative loss of habitat for migratory insects and native plants. The DEIS must be revised following professional site surveys of the West Hastings oil field and any other oil field where CO_2 captured at the LCCE Gasification Plant is injected.

VI. The DEIS Fails to Adequately Consider Alternatives

While there may be constraints on the DOE's ability to consider alternative projects (*see* 42 U.S.C. § 17251, § 16293), the DOE has arbitrarily constrained its options more narrowly than required by law.

DOE states that it did some environmental impact analysis on all of the projects that sought funding under this DOE program. DEIS at 1-3. These analyses were provided to the "selecting official" for consideration when deciding among the projects, but it is unknown to what extent the environmental impacts of each project were actually considered in selecting among them. DOE refers to this earlier process as the reason none of the other projects that DOE could have funded are included in the DEIS alternatives analysis. If these other projects would have met the "purpose and need" cited in the DEIS, they should be evaluated in this document, and their environmental impacts compared to the proposed action. Otherwise, the public is presented with a fait accompli, contrary to the requirements of NEPA.

Public 8-34

Even if this project was the least environmentally harmful of the projects the DOE has thus far considered, the huge amount of CO_2 that will be released as a result of this project will have severe and lasting environmental consequences. The

very purpose of this project stems from the recognition that releasing CO_2 into our atmosphere has had, and will continue to have devastating effects on the natural and human environment. Congress intended for the funding of these projects to be used to seek solutions to slow or stop the release of CO_2 into the atmosphere. Building a brand new source of emissions, producing methanol, which could be burned and produce more CO_2 emissions, and recovering oil, which would also be burned and produce more CO_2 emissions will not succeed in meeting the goals of this project.

Public 8-35

There does not appear to be any reason that DOE cannot place a second request for bids that better match the goals of section 703, particularly those related to the capture of emissions of already existing sources. The DEIS has failed to consider all alternatives by failing to analyze other projects from a second request from bids. The DOE should continue to seek out projects that more appropriately meet the goals of carbon capture and sequestration by not creating an unaccountable new source of CO_2 emissions.

Based on these concerns, the Sierra Club requests that DOE conclude that the Lake Charles CCS project will cause significant and irreparable environmental harm, and reject the project. Alternatively, we request that DOE fully and completely address the following concerns and re-issue the DEIS for further public comment.

Thank you for the opportunity to comment on the DEIS. I would be happy to provide further information on any of these issues or answer any questions that you may have.

Sincerely,



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July 31, 2013

Via email at *LeucadiaEIS@netl.doe.gov*

Mrs. Pierina N. Fayish
U.S. Department of Energy
National Energy Technology Laboratory
M/S 922-243D
P.O. Box 10940
Pittsburgh, PA 15236

Re: Supplemental Comments on the Draft Environmental Impact Statement for the Lake Charles Carbon Capture and Sequestration Project (DOE/EIS-0464D)

Public
8-36

Dear Mrs. Fayish,

Because information regarding serious threats to the environment and human health and safety from Denbury Resources' carbon sequestration operations has recently come to light, the Sierra Club wishes to supplement the comments we submitted on June 25, 2013, to the Department of Energy (DOE) on its Draft Environmental Impact Statement for the Lake Charles facility (DEIS). This information is critical to DOE's decision about the Lake Charles Carbon Capture and Sequestration Project (CCS Project); therefore the Sierra Club urges the DOE to thoroughly analyze in a revised DEIS the risks posed by Denbury's underground injection of carbon dioxide for oil recovery purposes.

Denbury Resources is the company that Leucadia has contracted with to provide sequestration of the carbon dioxide captured by the proposed project. However, that company, as discussed in a July 25, 2013 Associated Press article attached to this letter, has a poor safety and environmental record with injecting carbon dioxide into oil wells.[1] Several of Denbury's wells have blown out, resulting in dangerous amounts of CO_2 emissions. In some cases, emergency responders have had to wear breathing apparatus, deer and other animals have suffocated to death, and homes have been evacuated. These blowouts have had immediate serious impacts on the local environment by among other things, contaminating drinking water supplies. For example in a 2011 blowout in Yazoo County, Mississippi, a 2,000 foot deep hole released CO_2, oil, and drilling mud for 37 days. Denbury ultimately had to remove 27,000 tons of drilling mud and contaminated soil and 32,000 barrels of liquids from the site.

[1] Jeff Amy, *Denbury Pays Big Fine for 2011 Oil Well Blowout*, ASSOCIATED PRESS, July 25, 2013. A copy of the Associated Press article is attached as Exhibit S-1.

Public
8-36
Cont'd

Aside from the obvious and serious public health and safety concerns associated with these kinds of accidents, Denbury's record clearly raises concerns about the effectiveness of its enhanced oil recovery operations at actually sequestering carbon for the short or long term. This new information supports the Sierra Club's initial concerns about human health and safety, environmental harm, and climate change related to the CCS Project.

DOE's statutory authority to provide hundreds of millions of dollars of financial assistance for the Lake Charles CCS project comes from a law that seeks to prevent further emissions of CO_2 in order to mitigate climate change.[2] Denbury's dangerous history creates a real risk that the millions of tons of CO_2 intended to be stored through the CCS Project will be released back into the atmosphere. This potential for a huge release of CO_2 would not only defeat the purpose of the CCS project by further contributing to climate change, but would also be a serious threat to the environment and human health and safety. And to make matters worse, these risks would be happening near an area DOE has recognized as a potential environmental justice area. DEIS p. 4-90. The Sierra Club urges DOE to take a hard look at these real and very serious risks. The Sierra Club renews its request that DOE reject Leucadia's proposed project, or at the very least, issue a comprehensive revised DEIS that fully informs the public about the risks of Denbury's operations and allow for additional public hearings and public comment.

Thank you for the opportunity to supplement our previous comments. I would be happy to provide you with further information on this issue, or answer any other questions that you may have.

Sincerely,



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[2] 42 U.S.C. §17251.

Exhibit S-1

Denbury pays big fine for 2011 oil well blowout

By JEFF AMY, Associated Press
Updated 6:31 pm, Thursday, July 25, 2013

JACKSON, Miss. (AP) — Denbury Resources promises to bring new life to old oil fields by pumping in carbon dioxide to force additional oil to the surface. But the company's oil fields have seen a series of uncontrolled carbon dioxide blowouts that may bring up oil and drilling fluids with them.

Now, one of the biggest of those blowouts has resulted in Denbury agreeing to pay a $662,500 fine to the Mississippi Department of Environmental Quality over a 2011 oil well blowout in Yazoo County. It's one of the largest environmental fines Mississippi has assessed in the last 10 years.

And questions linger about whether Denbury and other companies pumping carbon dioxide underground are doing enough to ensure long-abandoned oil wells are safely capped and can stand up to the pressure that shoves up the oil.

Denbury has had at least two other Mississippi blowouts since 2007. It has been fighting another release near Delhi, La., since June 13. There, carbon dioxide and drilling fluids broke through the ground's surface.

Denbury, based in Plano, Texas, says the technique is decades old and it operates safely.

"Prior to commencing injections of carbon dioxide into an oil field, Denbury creates a development plan that includes an analysis of previously drilled well records," spokesman Ernesto Alegria wrote in an email Thursday. "Denbury's primary objective in creating the plan is to develop these fields in the safest and most efficient manner."

In 2007, the company saw carbon dioxide releases in Mississippi's Lincoln and Amite counties. In December 2007, a few Amite County homes were evacuated after a well that Denbury was working on blew out.

Already by that time, some in southwest Mississippi had warned that the pressure of the carbon dioxide could cause wells that had been capped decades ago to rupture. Environmental regulators said Thursday that's what happened at an abandoned well south of Yazoo City. The well's metal pipe had been stripped and the 2,000-foot-deep hole vented carbon dioxide, oil and drilling mud for 37 days starting Aug. 9, 2011.

So much carbon dioxide came out that it settled in some hollows, suffocating deer and other animals, Mississippi officials said. The company ultimately drilled a new well to plug the old one, and removed 27,000 tons of drilling mud and contaminated soil and 32,000 barrels of liquids from the site.

"It had serious impacts in the immediate vicinity," said Richard Harrell of the Mississippi DEQ.

Monitoring wells show no contamination in underground water supplies. That's a threat because the well crosses an aquifer used for drinking water in the Jackson area. Deeper down, it also crosses the Sparta aquifer, a significant drinking water source across the lower Mississippi Valley.

"Denbury has worked with government and local officials and agencies to thoroughly remediate any isolated and unrelated releases of well fluids in our operated fields," Alegria said.

Harrell said Mississippi fined the company because officials believe Denbury should have more closely inspected abandoned wells before it began injecting carbon dioxide. Instead, the company may have relied too much on paper records of old wells at the Mississippi Oil and Gas Board.

"A lot of this work, we felt, should have been done before they started flooding the field," Harrell said. "It was somewhat preventable."

The company said in a later stock filing that it re-plugged 28 wells in the Tinsley field. However, it never told stockholders about the blowout, only saying it slowed carbon dioxide injections and oil production because "we found that multiple wells, many dating back to the 1940s and 1950s, had been improperly plugged and abandoned by prior operators and did not have sufficient cement in them."

Mississippi Oil and Gas Board attorney Howard Leach said he didn't know of any new regulations to prevent a repeat. But carbon dioxide releases have continued.

Mississippi officials said corrosion in the top of a well casing allowed the gas to escape and bubble up in nearby water well in the Heidelberg field in Jasper County earlier this year.

More serious is what some people have termed an "underground blowout" near Delhi, La., in another old oil field that Denbury is reviving.

That incident was detected in northeast Louisiana's Franklin Parish on June 13, when a monitor showed unsafe concentrations of methane in the air. At first, authorities suspected a natural gas pipeline, but Louisiana Department of Natural Resources spokesman Patrick Courreges said it now appears two or more plugged wells gave way underground. Methane, carbon dioxide, oil, water, brine and sands pushed up through the earth in a sparsely populated, marshy area.

Concentrations of carbon dioxide were so high initially that Courreges said responders wore breathing apparatus to keep from suffocating.

Courreges said Denbury has stabilized the situation by pumping in "kill fluid" — water with lots of calcium chloride that forms a barrier keeping carbon dioxide from surfacing. He said hundreds of Denbury employees and contractors continue working in the area.

Courreges said that this is the first time that Louisiana regulators know of that carbon dioxide has vented to the surface in such large quantities. He said a cleanup will be needed, but because the investigation is still going on, he couldn't speculate about whether the state would fine Denbury. He also said it was too soon to tell whether Louisiana would change regulations governing enhanced oil recovery.

The company is using the same technique in Texas, Wyoming and Montana. Alegria said Denbury "works to apply the information gained from operating these floods to further improve their safety and efficiency."

—

Follow Jeff Amy at: http://twitter.com/jeffamy

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DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF

June 24, 2013

Operations Division
Regulatory Branch

Subject: Lake Charles Carbon Capture and Sequestration Project, DEIS
US Department of Energy (DOE/EIS-0464D)

U.S. Department of Energy
National Energy Technology Laboratory
P. O. Box 10940
Pittsburgh, Pennsylvania 15236

Gentlemen:

This is in regard to the Draft Environmental Impact Statement (DEIS) providing information on potential environmental impacts of DOE providing financial assistance to Leucadia Energy, LLC for the Lake Charles Carbon Capture and Sequestration Project under the Industrial Carbon Capture Sequestration Program (ICCS), which was forwarded to us by letter dated May 2, 2013.

We have reviewed the DEIS and find that the document addresses the considerations related to the stated purpose of project selection related to financial assistance to meet the goals of the ICCS Program. However, the information contained therein is insufficient to meet the National Environmental Policy Act (NEPA) requirements for Department of the Army regulatory actions under Section 10 of the Rivers and Harbors Act and/or Section 404 of the Clean Water Act for the specific actions identified therein. Each action and/or connected action associated with overall project implementation will need to be evaluated by the appropriate Corps of Engineers District office for compliance with those requirements under governing regulations and any necessary permits issued prior to construction of the individual components.

Agency
9-1

Thank you for the opportunity to review and comment on the DEIS. Should you have any questions concerning our comments, please contact Mr. Brian Breaux at (504) 862-1938 or at brian.w.breaux@usace.army.mil.

Sincerely

Martin S. Mayer
Chief, Regulatory Branch

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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281/286-8282 / (FAX) 281/488-5882

In Reply Refer To:
FWS/R2/CLES/

March 2013

Agency

10-1

Thank you for your request for threatened and endangered species, fish and wildlife, environmental, and/or aquatic resources information, comments, and/or recommendations within the United States Fish and Wildlife Service (Service) Clear Lake Ecological Service's area of responsibility. Our comments are provided in accordance with the provisions of the Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.), the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 et seq.), the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668 et seq.), the Fish and Wildlife Coordination Act (16 U.S.C. 661-667(e)), and the National Environmental Policy Act (42 U.S.C. §4321-4347 et seq.).

Endangered Species Act

The ESA and Federal regulations prohibit "take" of threatened or endangered species of fish and wildlife within the U.S. or its territorial waters. Please note that "take" is defined to mean "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." A county-by-county listing of federally listed threatened and endangered species that occur within this office's work area can be found at http://www.fws.gov/southwest /es/ ES_Lists_Main.cfm.

Section 7 of the ESA
According to Section 7(a)(2) of the ESA, it is the responsibility of each Federal agency to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any federally listed species. As such, Federal agencies are required to consult with the Service if it appears that any action they are proposing "may affect" a listed species.

To evaluate a project for its potential effect(s) to listed species, project proponents should use the county-by-county listing and other current species information[1] to determine whether habitat for a listed species is present at the project site. If potential habitat is present, a qualified individual should conduct surveys to determine whether a listed species is present. After completing a habitat evaluation and/or any necessary surveys, project proponents should evaluate the project for potential effects[2] to listed species and make one of the following determinations:

No effect – the proposed action will not affect federally listed species or critical habitat (i.e., suitable habitat for the species occurring in the project county is not present in or adjacent to the action area). No coordination or contact with the Service is necessary. However, if the project changes or

[1] For information regarding habitat requirements of federally listed species please visit http://ecos.fws.gov/.
[2] The effects of any action under Section 7 should be analyzed together with the effects of other activities that are interrelated to, or interdependent with, that action. Therefore, if your proposed action(s) is part of and depends on a separate action for its justification, or has no independent utility apart from the separate action, then it should be considered interrelated or interdependent and should be analyzed under Section 7 of the ESA.

additional information on the distribution of listed or proposed species becomes available, the project should be reanalyzed for effects not previously considered.

Is not likely to adversely affect – the project may affect listed species and/or critical habitat; however, the effects are expected to be discountable (extremely unlikely to occur), insignificant (can't be measured or detected), or completely beneficial. Certain avoidance and minimization measures may need to be implemented in order to reach this level of effect. You should seek written concurrence from the Service that adverse effects have been eliminated. Be sure to include all of the information and documentation used to reach your decision with your request for concurrence. The Service must have this documentation before issuing a concurrence.

Is likely to adversely affect – adverse effects to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. If the overall effect of the proposed action is beneficial to the listed species but also is likely to cause some adverse effects to individuals of that species, then the proposed action "is likely to adversely affect" the listed species. An "is likely to adversely affect" determination requires the Federal action agency to initiate formal Section 7 consultation with the Service.

Regardless of the determination, the Service recommends developing a complete record of the evaluation, including steps leading to the determination of effect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related articles.

Please be advised that while a Federal agency may designate a non-Federal representative to conduct informal consultations with the Service, assess project effects, or prepare a biological assessment, the Federal agency must notify the Service in writing of such a designation. The Federal agency shall also independently review and evaluate the scope and contents of a biological assessment prepared by their designated non-Federal representative before that document is submitted to the Service.

The Service's Consultation Handbook is available online to assist you with further information on definitions, process, and fulfilling ESA requirements for your projects at http://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf.

Section 10 of the ESA
Projects that do not involve a federal nexus can be evaluated under Section 10 of the ESA. If "incidental take" of a listed species is likely to occur during a proposed non-federal activity, then the project sponsor or landowner may apply for an incidental take permit under Section 10 of the ESA. Please see the following links for further guidance on Section 10 http://www.fws.gov/endangered/permits/index.html and http://www.fws.gov/southwest/es/AustinTexas/ESA_HCP_FAQs.html.

Candidate Species

Freshwater Mussels
The following species of mussels occur in Texas and are candidates for listing under the ESA: Texas fatmucket *Lampsilis bracteata*, golden orb *Quadrula aurea*, smooth pimpleback *Quadrula houstonensis*, Texas pimpleback *Quadrula petrina*, and Texas fawnsfoot *Truncilla macrodon*. We are also reviewing the status of six other species for potential listing under the ESA. One of the main contributors to mussel die offs is sedimentation, which smothers and suffocates mussels. To reduce sedimentation within rivers, streams, and tributaries crossed by a project, the Service recommends

that that you implement the best management practices within the enclosed document entitled *Best Management Practices for Projects Affecting, Rivers, Streams and Tributaries.*

Candidate Conservation Agreements
Candidate Conservation Agreements (CCAs) or Candidate Conservation Agreements with Assurances (CCAAs) are voluntary agreements between the Service and public or private entities to implement conservation measures to address threats to candidate species. Implementing conservation efforts before species are listed increases the likelihood that simpler, flexible, and more cost-effective conservation options are available. A CCAA can provide participants with assurances that if they engage in conservation actions, they will not be required to implement additional conservation measures beyond those in the agreement. For additional information on CCAs/CCAAs please visit the Service's website at http://www.fws.gov/endangered/what-we-do/cca.html.

Migratory Birds

The MBTA protects all native migratory birds and prohibits the taking, killing, possession, and transportation (among other actions) of migratory birds, their eggs, and parts, except when specifically permitted by regulations for specific intentional uses. A list of birds protected under the MBTA can be found in 50 CFR 10 of the MBTA and at http://www.fws.gov/migratorybirds/RegulationsPolicies/mbta/mbtandx.html. Activities that have the potential to take migratory birds as well as recommendations for reducing such take include:

Utility Lines
The construction of overhead power lines creates threats of avian collision and electrocution. The Service recommends the installation of underground rather than overhead power lines whenever possible. For new lines and/or the modification, maintenance, and update of old lines, we recommend that you implement the Avian Protection Plan guidelines for power lines found at http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/BirdHazards.html.

Communication Towers
Telecommunication towers are estimated to kill millions of birds per year. We recommend that you implement the guidance in *Service Guidance on Siting, Construction, Operation, and Decommissioning of Communication Towers*. This guidance can be found at http://www.fws.gov/habitatconservation/communicationtowers.html.

We request that you provide us with the final location and specifications of your proposed towers, as well as the recommendations implemented. A Tower Site Evaluation Form is also available via the above website; we recommend you complete this form and keep it in your files.

Land Clearing
Land clearing work can destroy active nests (eggs or young present) and kill birds. The Service recommends you review and implement the conservation actions for migratory birds outlined in the enclosed document entitled *Suggested Priority for Migratory Bird Conservation Actions for Projects.*

Colonial Water Bird Rookeries

Disturbance from construction activities and project operations can adversely affect breeding bird use of nesting sites and can result in nest abandonment and loss of reproduction. We recommend that

project activities do not occur within 1,000 feet of colonial waterbird rookeries during the nesting season from February 15 to September 1.

Bald Eagles

The bald eagle *Haliaeetus leucocephalus* is protected by the BGEPA and the MBTA. Accordingly, the Service recommends that project proponents use the *National Bald Eagle Management Guidelines* to avoid and minimize harm and disturbance of bald eagles. These guidelines can be found at http://www.fws.gov/migratorybirds/BaldAndGoldenEagleManagement.htm. Eagles are particularly vulnerable to disturbance throughout the nesting season, which in Texas is generally from October 1 to May 30.

Wetlands, Streams, and Other Aquatic Resources

Numerous projects along the Texas coast often impact wetlands, streams, or other aquatic resources or require work in a navigable waterway. Section 404 of the Clean Water Act regulates the discharge of fill material into waters of the U.S. (e.g., wetlands and streams) and Section 10 of the Rivers and Harbors Act of 1899 regulates work and/or structures within navigable waterways. The U.S. Army Corps of Engineers (Corps) is tasked with administering these regulations and we recommend that you coordinate your activities with the Corps for proper permitting and compliance with these regulations.

Thank you for the opportunity to provide comments on your project. If you need any additional information, you can contact one of our biologists (Donna Anderson, Moni Belton, Kelsey Gocke, Jeff Hill, Charrish Stevens, or Arturo Vale) at 281/286-8282.

Sincerely,

Edith Erfling

Edith Erfling
Field Supervisor

Enclosures

Suggested Priority of Migratory Bird Conservation Actions for Projects
U.S. Fish and Wildlife Service (USFWS), Migratory Bird Management

March 9, 2010

1. Avoid any take of migratory birds and/or minimize the loss, destruction, or degradation of migratory bird habitat while completing the proposed project or action.

2. Determine if the proposed project or action will involve below- and/or above-ground construction activities since recommended practices and timing of surveys and clearances could differ accordingly.

3. If the proposed project or action includes a reasonable likelihood that take of migratory birds will occur, then complete actions that could take migratory birds outside of their nesting season. This includes clearing or cutting of vegetation, grubbing, etc. The primary nesting season for migratory birds varies greatly between species and geographic location, but generally extends from early April to mid-July. However, the maximum time period for the migratory bird nesting season can extend from early February through late August. Also, eagles may initiate nesting as early as late December or January depending on the geographic area. Due to this variability, project proponents should consult with the appropriate Regional Migratory Bird Program (USFWS) for specific nesting seasons. Strive to complete all disruptive activities outside the peak of migratory bird nesting season to the greatest extent possible. Always avoid any habitat alteration, removal, or destruction during the primary nesting season for migratory birds. Additionally, clearing of vegetation in the year prior to construction (but not within the nesting season) may discourage birds from attempting to nest in the proposed construction area, thereby decreasing chance of take during construction activities.

4. If a proposed project or action includes the potential for take of migratory birds and/or the loss or degradation of migratory bird habitat and work cannot occur outside the migratory bird nesting season (either the primary or maximum nesting season), project proponents will need to provide the USFWS with an explanation for why work has to occur during the migratory bird nesting season. Further, in these cases, project proponents also need to demonstrate that all efforts to complete work outside the migratory bird nesting season were attempted, and that the reasons work needs to be completed during the nesting season were beyond the proponent's control.

   Also, where project work cannot occur outside the migratory bird nesting season, project proponents must survey those portions of the project area during the nesting season prior to construction occurring to determine if migratory birds are present and nesting in those areas. In addition to conducting surveys during the

nesting season/construction phase, companies may also benefit from conducting surveys during the prior nesting season Such surveys will assist the company in any decisions about the likely presence of nesting migratory birds or sensitive species in the proposed project or work area. While individual migratory birds will not necessarily return to nest at the exact site as in previous years, a survey in the nesting season in the year before construction allows the company to become familiar with species and numbers present in the project area well before the nesting season in the year of construction. Bird surveys should be completed during the nesting season in the best biological timeframe for detecting the presence of nesting migratory birds, using accepted bird survey protocols. USFWS Offices can be contacted for recommendations on appropriate survey guidance. Project proponents should also be aware that results of migratory bird surveys are subject to spatial and temporal variability. Finally, project proponents will need to conduct migratory bird surveys during the actual year of construction, if they cannot avoid work during the primary nesting season (see above) and if construction will impact habitats suitable for supporting nesting birds.

5. If no migratory birds are found nesting in proposed project or action areas immediately prior to the time when construction and associated activities are to occur, then the project activity may proceed as planned.

6. If migratory birds are present and nesting in the proposed project or action area, contact your nearest USFWS Ecological Services Field Office and USFWS Region Migratory Birds Program for guidance as to appropriate next steps to take to minimize impacts to migratory birds associated with the proposed project or action.

* Note: these proposed conservation measures assume that there are no Endangered or Threatened migratory bird species present in the project/action area, or any other Endangered or Threatened animal or plant species present in this area. If Endangered or Threatened species are present, or they could potentially be present, and the project/action may affect these species, then consult with your nearest USFWS Ecological Services Office before proceeding with any project/action.

** The Migratory Bird Treaty Act prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the Act has no provision for allowing unauthorized take, the USFWS realizes that some birds may be killed during construction and operation of energy infrastructure, even if all known reasonable and effective measures to protect birds are used. The USFWS Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to avoid take of migratory birds, and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve

individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent and effective measures to avoid that take. Companies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans and/or avian protection plans, and to implement those measures prior to/during construction or similar activities.

*** Also note that Bald and Golden Eagles receive additional protection under the Bald and Golden Eagle Protection Act (BGEPA). BGEPA prohibits the take, possession, sale, purchase, barter, offer to sell, purchase, or barter, transport, export or import, of any Bald or Golden Eagle, alive or dead, including any part, nest, or egg, unless allowed by permit. Further, activities that would disturb Bald or Golden Eagles are prohibited under BGEPA. "Disturb" means to agitate or bother a Bald or Golden Eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an Eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. If a proposed project or action would occur in areas where nesting, feeding, or roosting eagles occur, then project proponents may need to take additional conservation measures to achieve compliance with BGEPA. New regulations (50 CFR § 22.26 and § 22.27) allow the take of bald and golden eagles and their nests, respectively, to protect interests in a particular locality. However, consultation with the Migratory Bird, Ecological Services, and Law Enforcement programs of the Service will be required before a permit may be issued.

BEST MANAGEMENT PRACTICES FOR PROJECTS AFFECTING RIVERS, STREAMS AND TRIBUTARIES

The project crosses or potentially affects river, stream or tributary aquatic habitat. Therefore the Service recommends implementing the following applicable Best Management Practices:

1. Construct stream crossings during a period of low streamflow (e.g., July - September);
2. Cross streams, stream banks and riparian zones at right angles and at gentle slopes;
3. When feasible, directionally bore under stream channels;
4. Disturb riparian and floodplain vegetation only when necessary;
5. Construction equipment should cross the stream at one confined location over an existing bridge, equipment pads, clean temporary native rock fill, or over a temporary portable bridge;
6. Limit in-stream equipment use to that needed to construct crossings;
7. Place trench spoil at least 25 feet away landward from streambanks;
8. Use sediment filter devices to prevent movement of spoil off right-of-way when standing or flowing water is present;
9. Trench de-watering, as necessary, should be conducted to prevent discharge of silt laden water into the stream channel;
10. Maintain the current contours of the bank and channel bottom;
11. Do not store hazardous materials, chemicals, fuels, lubricating oils, and other such substances within 100 feet of streambanks;
12. Refuel construction equipment at least 100 feet from streambanks;
13. Revegetate all disturbed areas as soon as possible after construction to prevent unnecessary soil erosion. Use only native riparian plants to help prevent the spread of exotics;
14. Maintain sediment filters at the base of all slopes located adjacent to the streams until right-of-way vegetation becomes established;
15. Maintain a vegetative filtration strip adjacent to streams and wetlands. The width of a filter strip is based on the slope of the banks and the width of the stream. Guidance to determine the appropriate filter strip (stream management zone, SMZ) width is provided below; and
16. Direct water runoff into vegetated areas.

SMZ widths should consider watershed characteristics, risk of erosion, soil type, and stream width. SMZ widths are measured from the top of each bank and established on each side of the stream. Erosion risk is increased with sandy soil, steep slopes, large watersheds and increasing stream widths. Recommended primary and secondary SMZ widths are provided in the table below.

Stream Width (Feet)	Slope (Percent)	Primary SMZ (Feet)	Secondary SMZ (Feet)
<20	<7	35	0
<20	7-20	35	50
<20	>20	Top of slope or 150	75
20-50	<7	50	0
20-50	7-20	50	50
20-50	>20	Top of slope or 150	75
>50	<7	Width of stream or 100 max.	0
>50	7-20	Width of stream or 100 max.	50
>50	>20	Top of slope or 150	75

Reference

Arkansas Forestry Commission. 2001. Draft Arkansas Forestry Best Management Practices for Water Quality Protection.

BOBBY JINDAL
GOVERNOR

State of Louisiana

DEPARTMENT OF WILDLIFE AND FISHERIES
OFFICE OF WILDLIFE

ROBERT J. BARHAM
SECRETARY

JIMMY L. ANTHONY
ASSISTANT SECRETARY

June 25, 2013

National Energy Technology Laboratory
Attn: Pierina Fayish M/S 922-342C
P. O. Box 10940
Pittsburgh, PA 15236

RE: *Reference Number: DOE/EIS-0464D*
Applicant: Leucadia Energy, LLC

Dear Ms. Fayish:

The professional staff of the Louisiana Department of Wildlife and Fisheries (LDWF) has reviewed the above referenced Draft Environmental Impact Statement (DEIS) for the Lake Charles Carbon Capture and Sequestration Project (DOE/EIS-0464D) in Calcasieu Parish. The activity involves the construction and installation of a gasification plant, appurtenant pipelines, and infrastructure to facilitate the capture and sequester of carbon dioxide. Based upon this review, the following has been determined:

LCCE Gasification Plant

As detailed on page 3-35 of the DEIS, the proposed site was previously authorized by the U.S. Army Corps of Engineers (USACE) and impacts have been mitigated through acquisition of credits from a wetlands mitigation bank.

Agency 11-1

LDWF recommends that the facility have an adequate stormwater runoff plan to ensure that storage capacity of any adjacent receiving wetland is not exceeded to the point that they are excessively inundated.

Carbon Dioxide (CO_2) Pipeline Routes

Agency 11-2

LDWF previously commented (see attachment dated February 15, 2012) on the *preferred* CO_2 route in response to USACE Public Notice MVN-2012-00036-WII for Denbury Onshore, LLC. LDWF accepts the proposed preferred route, provided that recommendations made in that letter are adhered to and addressed by the applicant.

LDWF has reviewed the alternative CO_2 route, as depicted in "Figure 2.3-1" of the DEIS. The LDWF concurs with the evaluation on page 2-50 that the alternative route would have more stream and wetland impacts then the preferred route, thus LDWF is amenable to the preferred CO_2 route.

Water Supply Pipeline Route

As depicted in "Figure 1-2", the water supply line will be installed adjacent to the preferred CO_2 route and existing rights-of-way (ROW). LDWF supports the proposed alignment, provided that the construction ROW width is 75' and the permanent ROW width is 30' in wetland areas.

Agency 11-3

Access Roads

Should temporary access roads be required for construction activities in wetland areas, the applicant shall implement best management practices (BMPs) to ensure that adjacent wetlands and waterbodies are not impacted.

Culverts shall be installed and maintained at stream crossings and drainage features to ensure that existing flow of surface water is uncompromised.

Threatened and Endangered Species

Agency 11-4

The applicant requested and LDWF provided a T&E Species Review for the proposed activity on March 25, 2011 (see attachment). Since over two years have transpired since this initial T&E Species Review, LDWF recommends that the applicant follow-up with LDWF Natural Heritage Program staff to ensure that no new elements of conservation concern have been documented within the project vicinity. Please contact Ms. Carolyn Michon at 225-765-2357 for further information.

The Louisiana Department of Wildlife and Fisheries appreciates the opportunity to review and provide recommendations to you regarding this proposed Lake Charles Carbon Capture and Sequestration Project. Please do not hesitate to contact Habitat Section biologist Chris Davis at 225-765-2642 should you need further assistance.

Sincerely,

Kyle F. Balkum
Biologist Program Manager

cd

Attachments

c: EPA Marine & Wetlands Section
USFWS Ecological Services

United States Department of Agriculture

NRCS
Natural Resources Conservation Service
101 South Main
Temple, TX 76501-7602

May 14, 2013

Ms. Pierina N. Fayish
NEPA Document Manager
National Energy Technology Laboratory
P. O. Box 10940
Pittsburg, PA 15236

Dear Ms. Fayish:

We have reviewed the project information pertaining to the Lake Charles Carbon Capture and Sequestration Project which will involve the capture and sequestration of carbon dioxide from the Lake Charles Clean Energy (LCCE) Gasification Plant to be constructed in Calcasieu Parish, adjacent to the Port of Lake Charles, Louisiana.

Agency 12-1 | This project should have no significant adverse impact on the environment or natural resources in the area. We do not require any permits, easements, or approvals for activities such as this.

Thank you for the opportunity to review this proposed project.

Sincerely,

Salvador Salinas

SALVADOR SALINAS
State Conservationist

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

June 24, 2013

Ms. Pierina N. Fayish
NEPA Document Manager
National Energy Technology Laboratory
U.S. Department of Energy
P.O. Box 10940
Pittsburgh, PA 15236

Dear Ms. Fayish:

In accordance with our responsibilities under Section 309 of the Clean Air Act (CAA), the National Environmental Policy Act (NEPA), and the Council on Environmental Quality (CEQ) regulations for implementing NEPA, the U.S. Environmental Protection Agency (EPA) Region 6 office in Dallas, Texas, has completed its review of the Draft Environmental Impact Statement (DEIS) prepared by the U.S. Department of Energy (DOE) for the Lake Charles Carbon Capture and Sequestration Project located in Calcasieu Parish, Louisiana. This document was prepared in accordance with the NEPA and applicable implementing regulations.

Based upon our analysis, EPA rates the DEIS as "**EC-2**" (**Environmental Concerns-Request for Additional Information**). The "EC" rating is based on appropriate wetland Section 404 permitting, air quality impacts and mitigation. The "2" indicates the DEIS does not contain sufficient information in the areas of air quality, wetland permitting, environmental justice and tribal consultation. The EPA's Rating System Criteria can be found here: http://www.epa.gov/oecaerth/nepa/comments/rating.html.

Detailed comments on the DEIS are enclosed with this letter which more clearly identifies EPA's concerns and the information requested for incorporation into the Final EIS (FEIS). Responses to our comments should be placed in a dedicated section of the FEIS and should specify the specific location in the FEIS where the revision, if any, was made. If no revision was made, a clear explanation should be included.

EPA appreciates the opportunity to review the DEIS. Please send our office two copies of the FEIS, and an internet link, when it is sent to the Office of Federal Activities, EPA (Mail Code 2252A), Ariel Rios Federal Building, 1200 Pennsylvania Ave, N.W., Washington, D.C. 20004. Our classification will be published on the EPA website, www.epa.gov, according to our responsibility under Section 309 of the CAA to inform the public of our views on proposed Federal actions. If you have any questions or concerns, please contact me or Michael Jansky of my staff by e-mail at smith.rhonda@epa.gov or jansky.michael@epa.gov or by phone at 214-665-8006 or 214-665-7451, respectively, for assistance.

Sincerely,

Rhonda Smith, Chief
Office of Planning and
Coordination

Enclosure

DETAILED COMMENTS
ON THE
DEPARTMENT OF ENERGY
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE PROPOSED
LAKE CHARLES CARBON CAPTURE AND SEQUESTRATION PROJECT
LOUISIANA AND TEXAS

BACKGROUND

The Department of Energy (DOE) prepared this Draft Environmental Impact Statement (DEIS) to assess the potential environmental impacts associated with the proposed action to provide financial assistance to Leucadia Energy, LLC to construct the Lake Charles Carbon Capture and Sequestration (CCS) project. DOE's Industrial Carbon Capture and Sequestration (ICCS) Program provides financial assistance to support construction and operation of Leucadia's Lake Charles CCS project. DOE proposes to provide Leucadia with up to $261.4 million, which would constitute about 60 percent of the estimated $435.6 million total development and capital cost of the project.

The Lake Charles CCS project would demonstrate the capture of carbon dioxide from an industrial facility for use in an existing, commercial enhanced oil recovery (EOR) operation in the West Hastings oil field. Leucadia would build, own and operate the Lake Charles Clean Energy (LCCE) Gasification plant, a petroleum coke ("pet coke") gasification facility in Calcasieu Parish, adjacent to the Port of Lake Charles, Louisiana. The following comments are now offered for your consideration for preparing the Final EIS (FEIS).

COMMENTS

Wetlands

This proposed project requires a permit from the New Orleans District Corps of Engineers which is required under Section 404 of the Clean Water Act. Approximately 19 acres of wetlands would be impacted by the proposed project facility and approximately 73.34 acres of wetlands would be impacted by connected action, an eleven (11) mile pipeline. EPA has concern with the DOE's proposal to separately permit each pipeline crossing as a single and complete project" under Nationwide Permit # 12. We believe the pipeline is integral to the system described; *but for* the proposed processing facilities the pipeline would not exist. The pipeline does not have "independent utility", as defined in the regulations, since it would not be constructed absent the construction of other projects in the project area" (e.g. the processing facilities).

Recommendation:

Agency 13-1

It is EPA's position the pipeline crossings cannot be considered within the definition for "single and complete project" as defined at 33 CFR 330.2(i). As such, impacts of the pipeline and other facilities associated with the proposed project must all be evaluated

Agency 13-1 Cont'd

and included within the CWA 404(b)(1) Guidelines Analysis, and all wetland impacts must be mitigated under the one individual CWA 404 permit for the project. We ask for detailed discussion on the matter in the FEIS.

Air Quality

Summary Section, Lake Charles CCS Project CO_2 Pipeline, Page 15: This section of the DEIS discusses the emissions during construction of the CO2 pipeline. The DEIS further states that wastes generated during construction of the proposed CO2 pipeline would *primarily* consist of nonhazardous materials and that Denbury which owns interest in the West Hastings oil field, would arrange for acceptable off-site disposal.

Recommendation:

Agency 13-2

Although EPA acknowledges that the potential environmental impacts of the project will be addressed by the applicable permitting authorities (e.g., Texas Commission on Environmental Quality (TCEQ), Louisiana Department of Environmental Quality (LDEQ) and EPA Region 6) through the various permitting actions, approvals and studies as required by law, EPA recommends the FEIS provide more detailed discussion of waste disposal, specifically as it relates to the disposal of hazardous materials be included in the FEIS. Any potential air quality related impacts from disposal and associated transport activities should be discussed.

Environmental Consequences Section, 4.1 Introduction, Page 4-1: This section of the DEIS discusses the potential direct and indirect environmental impacts that would likely result from the proposed project. The DEIS states that the exact location of the equipment laydown and methanol/sulfuric acid storage area would have minor relevance to the evaluation of reasonably foreseeable adverse impacts in the environment.

***Recommendation*:**

Agency 13-3

EPA does not concur with this statement and recommends that the laydown area be identified and studied. A more detailed discussion should be presented regarding safeguards against any possible adverse air impacts associated with the storage of methanol and sulfuric acid, and identify persons at risk, including construction and plant personnel. Specifics should include a discussion of all applicable requirements for storage of these materials. Further discussion on this matter should be included in the FEIS.

Section 4.2 – Climate and Air Quality, Page 4-3: This section of the DEIS states that direct project impacts to ambient air quality will be temporary, primarily due to construction equipment emissions and airborne particulate matter/fugitive dust. The DEIS further states that air pollutant emissions from construction of the off-site pipelines and CO2 pipelines would likely occur simultaneously for a three month period and overlap with the LCCE Gasification plant and Lake Charles CCS project 40 month construction and commissioning schedule.

Recommendation:

Agency 13-4

EPA recommends that, in addition to all applicable local, state, or federal requirements, the following mitigation measures be included as applicable in a construction emissions mitigation plan or similar document in order to reduce air quality impacts associated with emissions of Nitrous Oxide (NOx), Carbon Monoxide (CO), Carbon Dioxide (CO_2), Particulate Matter (PM), Sulfur Dioxide (SO_2) and other pollutants from construction-related activities:

Fugitive Dust Source Controls:

- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative where appropriate at active and inactive sites during workdays, weekends, holidays, and windy conditions;
- Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions; and
- Prevent spillage when hauling material and operating non-earthmoving equipment and limit speeds to 15 miles per hour. Limit speed of earth-moving equipment to 10 mph.

Mobile and Stationary Source Controls:

- Plan construction scheduling to minimize vehicle trips;
- Limit idling of heavy equipment to less than 5 minutes and verify through unscheduled inspections;
- Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, prevent tampering, and conduct unscheduled inspections to ensure these measures are followed;
- If practicable, utilize new, clean equipment meeting the most stringent of applicable Federal or State Standards. In general, commit to the best available emissions control technology. Tier 4 engines should be used for project construction equipment to the maximum extent feasible;
- Lacking availability of non-road construction equipment that meets Tier 4 engine standards, the responsible agency should commit to using EPA-verified particulate traps, oxidation catalysts and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants at the construction site; and
- Consider alternative fuels and energy sources such as natural gas and electricity (plug-in or battery).

Administrative Controls:

- Prepare an inventory of all equipment prior to construction and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking;
- Develop a construction traffic and parking management plan that maintains traffic flow and plan construction to minimize vehicle trips; and
- Identify sensitive receptors in the project area, such as children, elderly, and infirmed, and specify the means by which impacts to these populations will be minimized (e.g. locate construction equipment and staging zones away from sensitive receptors and building air intakes).

Environmental Justice

Agency 13-5

The DEIS states that the DOE environmental justice analysis included consideration of whether the proposed project would cause a significant and disproportionately high and adverse effect on minority or low-income populations. Regarding the CO2 pipeline route, 14 census block groups in Census Tract 27 were identified as potential environmental justice areas.

Recommendation:

The FEIS should provide information on communications, outreach, programs, and procedures that will be implemented to specifically mitigate impacts to vulnerable populations.

Agency 13-6

Mossville, Louisiana, is a predominantly African American environmental justice community near Lake Charles. EPA Region 6 has worked with Mossville since 1997 on health concerns, dioxin contamination, drinking water quality, flaring and releases by industry, and safety concerns due to proximity to industry. The DEIS indicates the proposed CO2 pipeline route is near Mossville.

Recommendation:

The FEIS should provide information supporting that coordination has occurred with this community to discuss any potential impacts.

Agency 13-7

The DEIS states that there was consultation with federally recognized Native American tribes, but it does not indicate any coordination with state-recognized tribes such as the United Houma Nation in its environmental justice assessment. The proposed CO2 pipeline is located in a rural, sparsely populated area including eight residences within 50 feet of the right-of-way. The DEIS does not indicate whether the residents of these 8 homes are identified as low income and/or minority, and therefore needing additional mitigation measures.

Recommendation:

Agency 13-8

DOE should coordinate with state-recognized tribes like the United Houma Nation and other local officials to discuss the project, potential impacts, and mitigation opportunities.

Agency 13-7 Cont'd

DOE should provide information and training sessions on emergency procedures for residences living 50 feet of the right-of-way. DOE should also analyze appropriate socioeconomic information in order to determine whether these eight residences are a potential environmental justice area. DOE should then identify and implement any additional mitigation measures.

Tribal Consultation

EPA finds that the DEIS demonstrates that reasonable efforts were made by DOE to identify federally recognized tribes and tribal resources potentially affected by the proposed

project. It appears that tribal officials for each tribe have been contacted for government-to-government consultation.

Recommendation:

Agency 13-9 | EPA recommends that DOE continue to include all appropriate Native American tribes throughout the phases of the project.

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
1001 Indian School Road NW, Suite 348
Albuquerque, New Mexico 87104

ER 13/318
File 9043.1

June 20, 2013

VIA ELECTRONIC MAIL ONLY

Pierina N. Fayish
U.S. Department of Energy
National Energy Technology Laboratory
M/S 922-243D
PO Box 10940
Pittsburgh, PA 15236

Subject: Draft Environmental Impact Statement for the Lake Charles Carbon Capture and Sequestration Project, Lake Charles, Louisiana, and Brazoria County, Texas

Dear Mrs. Fayish:

Agency 14-1

The U.S. Department of the Interior has reviewed the subject notice. In this regard, we have no comment.

Thank you for the opportunity to review this document.

Sincerely,

Stephen R. Spencer, Ph.D.
Regional Environmental Officer

From: Pierina Fayish [mailto:Pierina.Fayish@NETL.DOE.GOV]
Sent: Tuesday, May 21, 2013 1:51 PM
To: Whitken, Janine
Subject: Fwd: DEQ SOV 130508/0815 US Dept of Energy-Lake Charles Capture

***Comment Received ***

>>> Beth Altazan-Dixon <Beth.Dixon@LA.GOV> 5/21/2013 1:31 PM >>>
May 21, 2013

Pierina N. Fayish, NEPA Document Manager
US Dept of Energy-NETL
P.O. Box 10940
Pittsburgh, PA 15236
LeucadiaEIS@netl.doe.gov
pierina.fayish@netl.doe.gov

RE: 130508/0815

US Dept of Energy-Lake Charles Capture
and Sequestration Project-Draft EIS-Leucadia Energy LLC
Cost Shared AARA Funding
Calcasieu Parish

Dear Ms. Fayish:

The Department of Environmental Quality (LDEQ), Business and Community Outreach Division has received your request for comments on the above referenced project.

Agency
15-1 After reviewing your request, the Department has no objections based on the information provided in your submittal. However, for your information, the following general comments have been included. Please be advised that if you should encounter a problem during the implementation of this project, you should immediately notify LDEQ's Single-Point-of-contact (SPOC) at (225) 219-3640.

Agency 15-2

- Please take any necessary steps to obtain and/or update all necessary approvals and environmental permits regarding this proposed project.
- If your project results in a discharge to waters of the state, submittal of a Louisiana Pollutant Discharge Elimination System (LPDES) application may be necessary.
- If the project results in a discharge of wastewater to an existing wastewater treatment system, that wastewater treatment system may need to modify its LPDES permit before accepting the additional wastewater.
- All precautions should be observed to control nonpoint source pollution from construction activities. LDEQ has stormwater general permits for construction areas equal to or greater than one acre. It is recommended that you contact the LDEQ Water Permits Division at (225) 219-9371 to determine if your proposed project requires a permit.
- If your project will include a sanitary wastewater treatment facility, a Sewage Sludge and Biosolids Use or Disposal Permit application or Notice of Intent must be submitted no later than January 1, 2013. Additional information may be obtained on the LDEQ website at http://www.deq.louisiana.gov/portal/tabid/2296/Default.aspx or by contacting the LDEQ Water Permits Division at (225) 219- 9371.
- If any of the proposed work is located in wetlands or other areas subject to the jurisdiction of the U.S. Army Corps of Engineers, you should contact the Corps directly regarding permitting issues. If a Corps permit is required, part of the application process may involve a water quality certification from LDEQ.
- All precautions should be observed to protect the groundwater of the region.
- Please be advised that water softeners generate wastewaters that may require special limitations depending on local water quality considerations. Therefore if your water system improvements include water softeners, you are advised to contact the LDEQ Water Permits to determine if special water quality-based limitations will be necessary.
- Any renovation or remodeling must comply with LAC 33:III.Chapter 28, Lead-Based Paint Activities; LAC 33:III.Chapter 27, Asbestos-Containing Materials in Schools and State Buildings (includes all training and accreditation); and LAC 33:III.5151, Emission Standard for Asbestos for any renovations or demolitions.

Agency 15-3

- If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's Single-Point-of-Contact (SPOC) at (225) 219-3640 is required. Additionally, precautions should be taken to protect workers from these hazardous constituents.

Currently, Calcasieu Parish is classified as attainment with the National Ambient Air Quality Standards and has no general conformity determination obligations.

Please send all future requests to my attention. If you have any questions, please feel free to contact me at (225) 219-3958 or by email at beth.dixon@la.gov.

Sincerely,



Beth Altazan-Dixon, EPS III
Performance Management
LDEQ/Office of the Secretary
Business and Community Outreach and Incentives Division
P.O. Box 4301 (602 N. 5th Street)
Baton Rouge, LA 70821-4301
Phone: 225-219-3955
Fax: 225-325-8148
Email: ***beth.dixon@la.gov***

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
P.O. Box 94245
Baton Rouge, Louisiana 70804-9245
www.dotd.la.gov
(225) 242-4502

BOBBY JINDAL
GOVERNOR

SHERRI H. LEBAS, P.E.
SECRETARY

February 5, 2010

Pierina Fayish
National Energy Technology Laboratory
P.O. Box 10940
Pittsburgh, PA 15236

Dear Ms. Fayish

Agency 16-1

We are in receipt of the Draft EIS for the Lake Charles Carbon Capture and Sequestration Project (DOE/EIS-0464D). According to information in the EIS, several major State highways, including the interstate, will be impacted by the project. General information regarding permits needed from the Louisiana Department of Transportation and Development (DOTD) for pipeline crossings of State highways can be found on DOTD's web site at http://www.dotd.la.gov/highways/maintenance/maintmgt/home.aspx.

The DOTD District 07 Permit Specialist in Lake Charles, Louisiana should be contacted for additional information regarding the required permits. The District 07 Permit Specialist is Mr. Roger Moses. He may be reached by phone at (337) 437-9130 or by email at roger.moses@la.gov. If we can be of further assistance, please contact my office at (225) 242-4502.

Sincerely,

N. Ardoin

Noel Ardoin
Environmental Engineer Administrator

Cc: Mr. Robert Jiles, District 07 Administrator
Mr. Roger Moses, District 07 Permit Specialist
Ms. Miriam Tullier

From: Pierina Fayish [mailto:Pierina.Fayish@NETL.DOE.GOV]
Sent: Monday, June 10, 2013 10:02 AM
To: Whitken, Janine
Cc: Cynthia Taub
Subject: Fwd: publc comment on lake charles carbon sequester plan for louisiana

Pleas add to comment record.

>>> Jean Public <jeanpublic1@yahoo.com> 6/8/2013 5:08 PM >>>
i have scanned the 800 page report and have comments on specific pages.

17-1 1. i do not believe this is good investment. the sequestered carbon can always arise with a huge explosion. i 17-2
believe this is a waster of american tax dollars. also the oil industry is so profitable they couldl pay for this
themselves without taxpayers being gouged. the oil industry creates the carbon.i also believe the area is being
17-3 polluted to too great a degree by all of this development. there is also huge use of water which can cause issues 17-4
forhealth since much of it is used to control dust (2-31).

17-5 pg 3-44 many bird species will be killed. all animals in the area will be brutalized and abused by this
development. red woodpecker bears all lose homes and food source and lives.

17-6 4-31 the high pressure pipeline is a horror for louisiana residents.

17-7 4-58 forests are being cut down causing climate change issues and turning th esite into a shrub habitatat grassland and heat island.

17-8 4-87 i take issue with local community gaining any money at all from this construction of the facility.

17-9 4-161 - much toxicity is being brought into this area so that the location will not be a desirable place to live.

17-10 5-25 the govt is making quite an assumption that burying co2 will move oil to a more suitable site. that could be terribly wrong. there seem to be no guarantees to the publc on this. taking so much out of the ground is

17-11 causing earthquakes all over america. other geological effects are being ignored in this plan12 - i d

17-12 5-28 construction costt bolster an economy for a while- a short while. when construction is over economic effect diminishes to zero. this construction does not help the local economy over the long term.

17-13 appd pg 9 - all bibliography referenced is 40 to 50 years old and completely obsolete.
app d 28 - and 29 - very obsolete references materials are objectionable
app a pg 3l and 30 - bibliography so old it offers no perspective for 2013

17-14 netl ltr of 8/15/12 i do not believe us taxpayers shoudl be paying for this product.
this comment is for the public record.please acknowledge receipt of this comment.
jean public

Message scanned by the Symantec Email Security service. If you suspect that this email is actually spam, please send it as an ATTACHMENT to spamsample@messagelabs.com

THE (GCELC) GULF COAST ENVIRONMENTAL LABOR COALITION'S COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED LAKE CHARLES CCS PROJECT

By John Paul Williams

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The Coalition represents the interests of groups with thousands of members, and their families, in the Gulf Coast area, including the vicinity of the proposed Lake Charles CCS Project. The Coalition's goals include support for stringent environmental requirements, while encouraging economic growth.

EXECUTIVE SUMMARY

Public 18-1

The DEIS failed to adequately and accurately describe:

*** The likely and potential CO2 (and equivalents, hereinafter CO2) emissions from the project, and the potential climate change impacts from the project.

***The project's water pollution discharges

***The project's cumulative impacts on the area's air quality

***The project's potential impacts from hazardous materials

THE DEIS FAILED TO DISCUSS THE PROJECT'S POTENTIAL CLIMATE CHANGE IMPACTS

The Draft EIS contained conflicting information about the project's performance and goals. The project's goal is to demonstrate advanced capture of carbon dioxide from an industrial process, and its sequestration underground.

Public 18-2

But the Draft EIS presents many different figures for just how much uncontrolled CO2 the plant will emit, from 4 million in the June 2012 announcement, to 5.2 million tons at p. 4-6, to 5.8 million tons at p. 2-42 in the DEIS.

Without an accurate and consistent figure for the project's CO2 emissions before, and after capture, reviewers are unable to determine whether the project meets its goals, and whether the stated and realized goals are appropriate for the expenditure of over one-quarter of a billion dollars of taxpayer money.

INCONSISTENT DESCRIPTIONS OF CO2 CAPTURE RATES AND TONNAGES

These inconsistencies extend to the Draft EIS' claims at 4-5 that the plant is designed to capture 89% of its carbon dioxide (equivalents), which the DEIS also opines at 5-19 would allow emissions of 642,443 tons/year of CO2. This tonnage of CO2 emissions is not consistent with the other conflicting CO2 emissions rates provided in the DEIS. For instance DEIS claims the project will capture 4.6 million tons at 4-23, which would allow about 1.2 million t/y of CO2 emissions, not 642,443 t/y, given the 5.8 million t/y estimate. Nor does the DEIS describe any restrictions imposed on the project developer which obligate them to capture any amount, or any percentage of CO2, for any period.

Public 18-3

The DEIS says a project goal is to confirm that 1 million tons of CO2 stays buried and accounted for. But the DEIS fails to plainly state the important details of the CO2 capture and sequestration scheme. Only under extended cross-examination of DOE's hired experts prior to the public hearing, could reviewers

discover that DOE only intends to require monitoring of the CO2 sequestration for a single year, and that year's worth of monitoring would only take place on only a fraction of the affected Hastings oil fields grounds. That incomplete monitoring would then be extrapolated to estimate whether 1 million tons/years was indeed sequestered.

Public 18-3 Cont'd

While the DEIS strives to give the impression the Project will capture 89% of the CO2 for the next 30 years, the unwritten and unspoken assumption is that the Project, at most, will only be under a legal obligation to actually capture any CO2 for a period of a single year. If CO2 capture, shipment, and sequestration proves problematic, or expensive, or the proffered price of CO2 falls, the DEIS does not provide assurance that CO2 will continue to be captured after one year.

Reviewers who read the DEIS will likely assume the project is obligated to capture 89% of the CO2 over the project's life. The DEIS contributes to that error by not setting out the likely and potential project performance.

The DEIS also fails to discuss the contractual obligations, if any, of the Project's developer to capture any amount of CO2 for any period, much less to capture 89% of the CO2 for the life of the plant.

Reviewers who were unable to attend the public hearings, and whom lacked the opportunity to question DOE's experts, would not be able to determine solely from reading the DEIS, that the project developer is only obligated to capture CO2 and monitor its sequestration for a single year of its decades of operation.

Public 18-4

The DEIS misleads reviewers into thinking the project will capture 89% of the CO2 for the project's life and will emit, at most, just over 600,000 t/y of CO2. In reality the project could emit almost 6 million tons/year of CO2 for decades, beginning in its 2nd year of operation, and that would be completely legal and apparently allowable under the conditions of the $261 million DOE grant to capture CO2.

Public 18-5

The DEIS failed to discuss the Project's potential impacts on climate change and the project goals, if the project abandons or reduces CO2 capture at some point, and fails to capture 89% of CO2 emissions. That would mean that the DOE's program to reduce CO2 emissions will have actually helped finance the new operation of one of the largest sources of CO2 in the entire state of Louisiana, which bristles with some of the largest industrial projects in the world. Supporting such a large new source of CO2 emissions is a highly significant and adverse impact that should have been discussed in the DEIS.

In summary, the Draft EIS has failed to provide a consistent description of the plant's controlled and uncontrolled CO2 emissions, the percentage and tonnages of CO2 capture that are possible or likely, the percentages and tonnages of capture that are actually required, and to discuss the possibility of no, or reduced CO2 capture. The State air permit is the only actual regulatory document governing the plant's air emissions, and it does not require any carbon dioxide capture at all.

THE DEIS CONTAINED GROSS ERRORS REGARDING THE PROJECT'S WATER POLLUTION

Public 18-6

The DEIS claims at p. 2-42 that the plant will discharge about 1200 gallons per minute of waste water, which calculates to about 1.5 million gallons per day, or about 5.5 million liters per day.

Public 18-6 Cont'd

At page 4-35 we see that the waste water will be permitted to contain 65,000 mg/l of copper and 72,000 mg/l of mercury. That's roughly a permitted total of 137 grams or about 5 ounces of heavy metals per liter, (and almost 4 liters per gallon) or about a pound of heavy metals in every gallon. In other words, taking these figures at face value, the plant is permitted to discharge a total of about a million pounds of these two toxic metals per day in its waste water. That's beyond absurd.

The DOE experts conceded in private discussions, before the public hearing, that the Draft EIS contains errors regarding the project's waste water discharges. Again, reviewers that did not attend the public hearing, or whom were unable to grill the DOE experts, or whom were not privy to these private discussions, were unable to determine, solely by reading the DEIS, the true impacts of the project's waste water discharges.

Table 4.4-5 also presented inaccurate and misleading figures for the Project's permitted concentrations of oil & grease, total organic carbon, and pH in its effluent.

The DEIS should never have been issued for public review with such errors. Take the DEIS' figure of 72,000 mg/l of mercury in the Project effluent. A milligram is a 1000th of a gram. But the water quality limits for mercury are measured in billionths of a gram (.012 ug/l). So just one milligram per liter would be a concentration of thousands of times more mercury than allowed. And according to the DEIS, the plant is allowed to discharge mercury at 72,000 mg/l. The copper violations, according to the DEIS figures, would be almost as profound.

COALITION REQUESTS A SDEIS

The Coalition asks the DOE to issue a supplemental DEIS that contains an accurate description of the project's waste water, and the likely impacts. The SDEIS should allow an additional 45 days for public comment on that document, since the SDEIS will be the reviewers' first chance to look at an accurate summary of water quality impacts.

SDEIS SHOULD IDENTIFY THE SOURCE OF THE METALS DISCHARGE FIGURES

The SDEIS should also explain the source of the purported discharges of 72,000 mg/l of mercury and 65,000 mg/l of copper. The Project will include miles of piping from which copper could leach. The Project could include massive uncovered storage piles of pet coke from which metals could leach during rain storms. It's possible that the 65,000/72,000 mg/l or similar concentrations of metals could be discharged from these or other Project sources in relatively low volumes. The SDEIS should clearly identify any Project sources that will discharge effluent containing metals or other contaminants.

DEIS DID NOT DISCLOSE TMDL STATUS

The DEIS' currently flawed discussion of waste water discharges has failed to provide an accurate discussion, and serious consideration of the Project's likely potentially significant impacts on water resources from its apparent 1.5 million gallon/day discharge, assuming that figure in the DEIS, at least, was accurate.

Public 18-7

The DEIS did not describe the status of the contaminated surface waters in the project

Public 18-7 Cont'd

vicinity and the degree to which the Project will cause and contribute to those problem. The DEIS failed to inform reviewers of the TMDL designations for the receiving waters of the Calcasieu Estuary.

The Project owner admitted in September 28, 2009 correspondence that the Project's non-contact blowdown water could contain mercury and copper. The DEIS' failed to accurately describe this potential impact.

DEIS INADEQUATELY DISCUSSED THE PROJECT'S WATER POLLUTION

The DEIS, at page 4-35, purports to discuss the environmental consequences of the Project's waste water discharges, but only states, in a single sentence, that Leucadia would comply with any pollution permit limits. That terse conclusion is not sufficient, especially given the known errors in the DEIS' water pollution discussion and the DEIS' inaccurate description of the pollution permit limits.

THE DEIS FAILED TO DISCUSS THE PROJECT'S IMPACTS ON THE AREA'S AIR POLLUTION

Public 18-8

The Draft EIS refuses at 5-18 to study whether the gasification plant will cause or contribute to the local air pollution problems. The Draft EIS claimed the plant would cause an insignificant increase in pollution. But page 4-6 shows the plant will increase nitrogen oxides levels by .95 ug/m3, when the significance threshold is 1. So the plant is within a rounding error of causing a significant impact. Likewise sulfur oxides emissions will cause an increase of over 24.05 ug/m3 when the SIL threshold is just 25. The DEIS does not cite a NEPA regulation that deems emission impacts below the SIL to be unworthy of a cumulative impacts discussion.

The Project area's current ozone concentrations are .073, ug/l, compared with the air quality standard of only .075, as an 8-hour average. So just a 3% increase in air pollution will cause violations of the Ozone standard, which will then cause significant and adverse human health problems. Breaking the Ozone limit also makes it much harder for new industry to site here.

The Project operations will emit 180 tons/year of Ozone precursors. Construction, including related projects will emit another 1000+ tons of precursors, so the Project will degrade Ozone levels.

Yet the Draft EIS refused to study whether this plant, in combination with the many other new smokestack industries that have applications pending, will cause that 3% increase in Ozone levels.

Public 18-9

The Draft EIS listed only 4 upcoming projects at Table 5.1-1, for which the Leucadia project will have cumulative air quality impacts. That list was painfully incomplete. It includes the Sasol gas-to-liquids plant, but leaves off the operation of the new Sasol ethylene crackers or the expansion of the Westlake ethylene plant. It includes 3 LNG export terminals, but leaves off several other nearby LNG export terminal projects; the large Magnolia LNG and Golden Pass expansions, and the smaller Waller, Gasfin, and Venture Global LNG export terminals in Cameron Parish.

All the DEIS did was provide (an incomplete) list of upcoming projects, without even discussing their cumulative air pollution impacts, in combination with the gasification plant.

Public 18-10

Construction of the Project and related elements will also produce very large increases in air pollutant discharges; 363 t/y of NOx for the 3 years of project construction, and 766 tons of PM-2.5/10 for the water and hydrogen pipelines. While the emissions are temporary, these levels of pollution could cause local areas of non-attainment, for instance, for the 1-hour NOx or 24 hr. PM-2.5/10 standards. The DEIS should have analyzed for those potential impacts.

THE DEIS FAILED TO ACCOUNT FOR THE PROJECT'S SHIFTING DESIGNS

Public 18-11

DOE originally backed this project to manufacture synthetic natural gas from petroleum coke, and then recover and pipe the CO2 to the Hastings oil fields. Despite the developer's extravagant claims to DOE in 2008 that natural gas was soaring to $12, the price of gas plummeted to below $3, destroying the developer's market plans. Leucadia then redesigned the plant to produce methanol, rather than synthetic natural gas. DOE seemed undaunted at Leucadia's appalling miscalculation of energy prices, and continued to back this plant when it altered its plans, to manufacture methanol from petcoke instead.

QUESTIONS ABOUT THE DEIS' PROJECT DESCRIPTION

COKE CRUSHING AND STORAGE NOT DISCUSSED IN DEIS

Public 18-12

Because the Project's design has changed so radically, the DEIS may not have kept up with the changes. For instance the DEIS fails to inform reviewers that the Port of Lake Charles is supposed to crush the incoming petcoke and apparently transfer the crushed coke, via uncovered conveyor, to the Project site. (URS, March 2009, p 1-3) The DEIS thus fails to inform reviewers of the likely PM emissions, which would include toxic metals such as nickel, from the unloading, crushing, conveying, and dropping of the crushed petcoke.

Public 18-13

Although proposed Best Management Practices would include enclosed storage of petcoke, the DEIS did not discuss potential BMPs and whether the coke would be enclosed, either at the Project or at the Port. Instead the DEIS conceded at 4-35 that "material handling and storage areas would be exposed to storm water," without discussing BMPs or alternatives that would reduce pollution from these sources. Open piles of coke "materials", if allowed, would also allow wind-blown air emissions which would include toxic metals. We were unable to find consideration of the coke crushing and storage emissions in the air permit.

ADDITIONAL TRUCK TRAFFIC

Public 18-14

There will be additional truck traffic, with its resulting air quality and traffic impacts, to haul away 500 ton/day filter cake from the clarifier that processes the gasification process wastewater. The DEIS didn't identify that aspect of truck traffic at p. 2-37 so the Coalition is uncertain if it was taken into consideration.

Public 18-15

The filter cake from the gasification wastewater clarifier is separate from the filer cake referenced in Table 2.5-3, which states there will be less than 2000 tons of filter cake generated from river water

Public 18-15 Cont'd

treatment. That Table fails to state that 2000 tons is the annual production. That table should clearly label the time period for the filter cake output for reviewers.

HEAVY METALS WASTE STREAM NOT DISCLOSED

Public 18-16

Table 2.5-3 also fails to disclose the generation and disposal of 8 tons/day of Heavy Metals Precipitate, and its likely destiny and subsequent environmental risks. It also apparently underestimates the discharges of salts from process wastewater evaporation by 365 tons/year.

THE DEIS FAILED TO DISCUSS THE IMPACTS, OR EVEN THE LOCATION, OF HAZARDOUS MATERIALS STORAGE

The Project will produce and store large amounts of methanol and sulfuric acid (and chlorine). These are extremely dangerous materials and releases of large quantities could produce catastrophic consequences. Yet the DEIS has jumped the gun, and gone to press without even knowing the location of the methanol and acid storage areas. Reviewers are thus denied access to vital details including the distances from the tank farm to residences or other sensitive receptors, the terrain, whether the proposed site contains wetlands, and whether it is adjacent to surface waters.

POTENTIAL IMPACTS FROM ACID, METHANOL AND CHLORINE RELEASES

Public 18-17

The DEIS ay Table 4.15-3 claimed the chances of a storage tank release of these chemical is “Extremely Unlikely.” But Sulfuric acid infamously ranked 4rd on a list of chemical releases ranked “serious” in one federal study, with 418 releases that caused a total of 8 deaths, 425 injuries, and 20 evacuations of a total of 14,145 persons. (Chemical Emergency Preparedness and Prevention Office, Report to Congress. EPA 550-R-93-002. Figure 1-13, p. 15).

Methanol releases separately caused 9 deaths and 29 injuries from 49 releases that produced 3275 evacuatees.

Likewise, the DEIS considered the risk of a transportation-related release to be “Incredible,” literally less than one chance in a million. But that still translated to 1546 transportation-related releases of sulfuric acid, and 652 releases of methanol, during the time period studied in the above-cited study.

In summary, because of the potential serious impacts from the proposed offsite chemical storage, the DEIS should have been postponed until it could identify the proposed chemical storage site. Then the site could be analyzed for its risk to its neighbors, including but not limited to the accurate modeling of various sizes of chemical releases, and the area’s ability to be rapidly and safely evacuated in the event of a large scale chemical release.

Public 18-18

Folks live within a mile of the Project so they are potentially at risk. The Aloha modeling in Appx. F showed impacts for 1.2 miles from a large methanol release, for 6 miles from a chlorine release, and no modeling for a sulfuric acid release. That modeling is further flawed because it could not take into consideration the actual terrain involved.

Attachment 6

Comments and Responses

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Response to Comments

1 Commenter: Randy Roach, Mayor of Lake Charles

Comment 1-1*: The community of Lake Charles does not see any adverse environmental impact effect in the area. They see it as an advantage for the community. It will make the nation more efficient and enhance the energy security of the country.*

Response: Thank you for your comment.

Comment 1-2: *Not only from the standpoint of its objective as an environmental project, but an environmental project that recycles petroleum coke which is a byproduct of the refinery process I think this is going to be beneficial to this area.*

That is produced at the other facilities in this area. This is a convenient way to take that and to use that to convert it into CO_2. Take that CO_2 and put it in the pipeline and then make some of the existing oil fields that we have around the area, around the nation to be more efficient and to extract as much as we can in order to enhance the energy security of this country.

Response: Thank you for your comment.

2 Commenter: Charlie Atherton, Citizen

Comment 2-1*: I can't minimize the concern of the people that already have -- that live or work down on the east end of Bayou D'Inde Road. There's only one way in and one way out. And through the years, there's been concerns about egress and ingress especially in emergency response situations because there is only one way in and one way out. Right across from the facility the road goes north. There used to be a bridge there. They even talked about, you know, putting the bridge back in a while back. But just to ignore the concern of the safety emergency response ingress/egress at this point it serves the public better to at least make you aware that's an issue and concern. Of course, if we put the bridge back in, it would likely be better.*

Response: Leucadia has identified the need to have an onsite emergency response team to respond to fires, spills, and other events that could cause harm to persons or the environment. Leucadia would also meet with municipal emergency response teams prior to operation of the LCCE Gasification plant to discuss its emergency response plans. In the event of the release of reportable quantities of a hazardous substance, the emergency response plan would be initiated and the appropriate authorities would be notified.

As described in Section 4.13.2.2, DOE anticipates that operation of LCCE Gasification will require compliance with the EPA Chemical Accident Prevention program in 40 CFR 68 for one or more chemicals and with OSHA's Process Safety Management standards in 29 CFR 1910. The emergency response plans required under these plans provide the basis for planning and implementing use of emergency equipment at the facility or from local resources, and if the need for potential evacuations. In particular, 46 CFR 68.95 requires the owner or operator to

development implement an emergency response program that includes procedures for informing the public and local emergency response agencies about accidental releases and procedures for the use of emergency response equipment. The emergency response plan must be coordinated with the community emergency response plan. OSHA standards will require development of an emergency action plan (EAP). The EAP must include evacuation procedures and emergency escape route assignments at the facility.

In addition, Leucadia would implement prevention and mitigation measures to prevent potential accident situations, as described in Section 4.14.

Comment 2-2: *It appeared that if the DOE doesn't put in money in it then the project won't be built. It would appear that the project ought to stand on its own financially and then if DOE wants to do their thing, then okay. But for it to be conditional with public money is a concern.*

Response: Leucadia and Denbury have stated that they intend to build the proposed project and connected action with or without DOE funding. NEPA requires that an EIS evaluate the range of reasonable alternatives to an agency's proposed action. As described in Section 1.5.3, the range of reasonable alternatives encompasses those alternatives that would satisfy the underlying purpose and need for agency action, including the possibility that the agency would not take action (which is the no action alternative). For the purposes of conservative analysis, DOE assumed that all or part of the LCCE Gasification plant and Lake Charles CCS project would not be completed without DOE funds. This assumption does not reflect the likelihood of the project proceeding without DOE funding; it was chosen to illustrate the maximum difference in impacts between the baseline environmental conditions and the impacts from the project.

Comment 2-3: *We also have some small concern that products that are produced by a government-subsidized plan might cause other plants in other parts of Texas to shut down or have layoffs, especially in the methanol products.*

Response: The gasification plant, which produces methanol and hydrogen, would not receive funding from DOE. DOE would fund the CO_2 capture and compression units, 11.9- mile CO_2 pipeline, and research MVA program. Leucadia intends to build the gasification plant and produce methanol and hydrogen regardless of DOE's decision on the proposed project, as discussed in the response to Comment 2-2.

The comment regarding the possible displacement of jobs in the United States and the Gulf Coast region due to the production of methanol by the Lake Charles project raises issues regarding national and world methanol markets. With respect to methanol, the United States saw a rapid decline in domestic methanol production in the 1990s due to a variety of reasons, including high natural gas prices in the United States and movement of domestic production to other countries. In 2002, methanol imports exceeded methanol produced (MI 2002). In 2013, global methanol demand is expected to reach 65 million metric tons compared to 40 million metric tons in 2008 (MI 2013). Given the rising global demand for methanol, DOE would not expect the LCCE Gasification plant to cause other similar plants to shut down or have layoffs.

References:

Methanol Institute (MI). 2002. Methanol Market Distribution Infrastructure in the United States, DeWitt & Company, Inc. September 2002. Available at:

http://www.methanol.org/methanol-basics/resources/dewitt-study-v2.aspx. Accessed on October 3, 2013.

Methanol Institute (MI). 2013. The Methanol Industry. Available at: http://www.methanol.org/Methanol-Basics/The-Methanol-Industry.aspx. Accessed on October 3, 2013.

Comment 2-4: *But we also have a concern on something just as simple as an impact on the ship channel. I mean, to the public when you got three LNG facilities that want to do exports and they're all talking about roughly 200 ships a year, that's 600 ships. But that's 600 in to get it and 600 out, and there are only 365 days in the year and we're always concerned about the ability of our crew ships and other ships and barges that utilize the channel because we don't want to jeopardize our existing facilities for a new guy. That sounds crude but they've been here forever and they're our backbone and they've got us where we are. So we certainly think that the ship traffic ought to be looked at with the new projected growth because there's supposed to be several billion dollars, you know, worth of maybe 40, 50 billion dollars' worth of work that's coming into this area. And I don't know that the EIS has taken all of that into account because this may have become known after the EIS was started.*

Response: The US Coast Guard Marine Safety Unit based in the Port of Lake Charles, Louisiana estimated in 2012 there are approximately 1,000 vessels arrivals per year at the Port (GSN 2012). The ship traffic is estimated because actual traffic data is not available (Brinkman 2013). The estimated total ship traffic for the LCCE is 12 trips per year (see Table 4.15-4). This vessel traffic represents approximately 1.2 % of the total current vessel traffic at the Port of Lake Charles. Therefore, the addition of the project-related ship traffic would have a negligible effect given the current level of ship traffic.

In terms of cumulative impacts, Trunkline LNG and Magnolia LNG have submitted FERC permit applications and would also operate at the Port of Lake Charles if FERC and the other regulatory authorities approve their applications. Each would increase vessel traffic at the Port of Lake Charles. The estimated vessel traffic associated with the Trunkline LNG project is 175 vessel trips per year (FERC 2002). Although no current information exists as to the estimated vessel traffic of the Magnolia LNG project, based on the proposed export capacity of 0.5 Bcf, the estimated vessel traffic is 45 ships trips per year. Assuming that both LNG projects are constructed and operate at full capacity, the estimated vessel traffic combined with the LCCE increases the vessel traffic approximately 23.2% over the existing vessel traffic.

The Port of Lake Charles has initiated a traffic study for the Calcasieu Ship Channel as a result of the many developments on Port property and along the ship channel. The current schedule calls for the study to be complete in March of 2014. It is anticipated that the study will not find a capacity issue but rather outline a strategy to manage the increased traffic (Brinkman 2013).

References:

GSN 2012 Government Security News: Busy Louisiana Port Gets New Coast Guard Safety Unit Commander. June 29, 2012. Available at http://www.gsnmagazine.com/node/26663?c=maritime_port_security. Accessed on August 5, 2013.

FERC 2002. CMS Trunkline LNG Company, LLC.; Notice of Intent To Prepare an Environmental Assessment for the Proposed Trunkline LNG Expansion Project, Request for Comments on Environmental Issues, and Notice of Public Meeting. A Notice by the Federal Energy Regulatory Commission on 02/20/2002. Available at https://www.federalregister.gov/articles/2002/02/20/02-4033/cms-trunkline-lng-company-llc-notice-of-intent-to-prepare-an-environmental-assessment-for-the. Accessed on August 5, 2013.

Brinkman, D. Lake Charles Harbor & Terminal District. 2013. Email communication with Gerardo Ruiz de la Pena, Ecology and Environment, Inc. about the capacity of the Port. August 13 and October 22, 2013.

Comment 2-5: *We also understand that the industrial capture of CO_2, we're of the opinion that that actual capture process is unproven technology. And we don't find a detailed explanation of the DOE CO_2 capture and sequestration requirements and how DOE is going to monitor the compliance. We don't know at what point DOE would pull their funding or at what point they would decide to shut the facility down. And I guess in short with the public, we would like to a copy of the contract, you know. Exactly what is it they have to do and how are you going to monitor to prove that it's being done. That you actually sequestered whatever the -- whatever the amounts are.*

Response: As described in Section 2.6.3.2, Leucadia elected to use a Rectisol® system for acid gas removal over other systems for its ability to achieve high sulfur and CO_2 removal. Since the 1960s, Rectisol® has been in use to remove acid gases such as CO_2 and hydrogen sulfide from gas streams (Lurgi 2008). While Rectisol® is proven technology, this project was designed to demonstrate the integration of that technology with the larger plant and other chemical processes. Demonstration projects are research-based and it is possible that the technology would not perform properly. If Leucadia complies with the terms of the Cooperative Agreement (CA) and makes a good faith effort to meet the FOA capture and sequestration goals, DOE funds would remain available to the project. Should Leucadia fail to satisfy the terms and conditions of the Cooperative Agreement, DOE could withhold federal funding or seek other remedies within DOE's legal authorities.

The CA requires reporting of both the capture and sequestration of CO_2. Leucadia is required to report CO_2 capture data to DOE under the terms of the CA. The minimum capture requirements of the ICCS Program are that recipients report "the degree to which the project makes progress toward capture of 75% of the CO_2 from the treated stream comprising at least 10% CO_2 by volume that would otherwise be emitted." While Leucadia proposed the project to have capture efficiencies greatly exceeding this minimum capture requirement, this is the ICCS Program goal against which they will be evaluated. The proposed Lake Charles CCS project is required to report "chemical composition and flow rate (tons per hour) of the captured CO_2 stream, plant operating efficiency with and without CCS, and tons of CO_2 sequestered per dollar of CCS capital cost and per dollar of CCS operating cost (on an annual basis)." Under the terms of the CA, this data would be reported to DOE on a monthly basis. While the monthly data would be proprietary, Leucadia must also prepare publically-available reports on a quarterly basis. The CA currently requires submission of 18 months of capture data. In addition to DOE's requirements, the project must monitor and report capture data in accordance with EPA regulations, as described below.

The research MVA (Monitoring, Verification, and Accounting) plan, described in detail in Sections 2.3.2.3 and 2.5.4 of the EIS, is the vehicle for monitoring the sequestration of CO_2 in a portion of West Hastings oil field. Under the terms of the CA, this data would be reported to DOE on a monthly basis. While the monthly data would be proprietary, Leucadia must also prepare publically-available reports on a quarterly basis. In addition to DOE's requirements, the project must monitor and report data in accordance with the terms of the Underground Injection Control (UIC) Class II permit, as described below.

The monitoring imposed by DOE is not intended to satisfy regulatory requirements, but rather is intended to provide operational, technical, and financial data for the purpose of advancing the science of CO_2 and fulfilling DOE's core objectives. DOE is using the reported data for research, thus the required monitoring and reporting is finite in length. Monitoring for regulatory purposes will be done by the responsible parties at the locations and with the frequency specified by the regulatory authorities.

- U.S. EPA requires CO_2 capture reporting. Under the Greenhouse Gas Reporting Rule, the project must report capture data, including the total mass of CO_2 that is captured from each production process unit and supplied to any third-party, to EPA for the life of the LCCE Gasification plant. The reported information will be made public as required by EPA.
- Under the terms of the Class II Underground Injection Control (UIC) permit, Denbury must complete monitoring of the injected CO_2. These requirements are discussed in detail in Section 2.3.2.3 of the EIS. The Texas Railroad Commission regulates Class II activities at the West Hastings oil field. Similar agencies regulate UIC activities in other locations where Denbury has operations that may inject CO_2.

Reference:
Lurgi. 2008. Reference List Gas Purification and Sulphur Technologies RECTISOL. January 25, 2008.

Comment 2-6: *We would like to see that -- wherever that 40-acre laydown yard is for equipment that is going to be used to store methanol and sulfuric acid, we would like to see that identified and possibly an EIS done on that site just like you're doing on this site.*

Response: At the time DOE published the draft EIS, neither the LCCE Gasification plant construction laydown area nor the water supply and hydrogen pipeline corridor locations were finalized. Since publication of the draft EIS, Leucadia has determined it would lease up to 40 acres within a 120 acre parcel along Bayou D'Inde Road from the Port of Lake Charles to use as the construction laydown and storage area. Since the 40-acre site within this parcel to be allocated by the Port for LCCE storage has not been specified, DOE assessed the total 120 acre area in this EIS for potential impacts. A desktop study was conducted and used to qualitatively assess potential impacts for the final EIS. The final EIS contains this new information in Chapters 2, 3, 4, and 5.

The Port is in the process of acquiring portions of the 120 acre parcel. The Port will own the entire parcel, of which LCCE will lease up to 40 acres. The Port will be responsible for the Section 404 permitting and associated mitigation for the entire site. The Port is in the process of acquiring the property, therefore, environmental field studies to characterize the site have not

been conducted. All required surveys, including cultural and species, will be performed as part of the permitting process before any construction begins on site.

Should the final alignment of linear facilities and projected resource impacts not be bound by the analysis in the FEIS, DOE may elect to implement additional analysis as per 10 CFR 1021.314.

Comment 2-7: *The overall concern is the ozone going into non-attainment. And we're not far from that. And when you have -- I mean, this was a recent article for notification, whatever you want to call it, from the Chamber Southwest, local alliance, whatever you want to call them. I mean, they get down to the weed eaters and lawn mowers. So they're trying to educate the public and the businesses what we can do to stay within compliance. And my concern is if we go into compliance, for the most part, all of the area industries and businesses, to my understanding, have done basically what needs to be done to keep us in compliance. And we're concerned with whatever is coming in is going to put us into nonattainment. So I'm not really willing to see our local industries jeopardized with their ability to operate or to expand because we're in noncompliance of the ozone. So I don't think in my opinion -- I just don't -- I've read the ozone stuff and the EIS, and I think it deserves further review.*

Response: Section 3.2.2 describes the 2008 ambient ozone concentrations in Calcasieu Parish, the ambient air quality standard, and the status of the maintenance plan that demonstrates how compliance will be maintained. Section 5.2.1 states that the LCCE Gasification plant emissions are lower than the regulatory thresholds for a cumulative impact.

Within air permitting regulations, thresholds known as significant impact levels (SILs) define ambient concentration levels below which a facility would not contribute to a significant (cumulative) impact. The dispersion modeling for the LCCE facility (the connected action) was performed according to a modeling protocol reviewed and approved by the LDEQ, and as noted in the comment, modeled impacts were below applicable SILs.

Exceeding a SIL does not result in nonattainment; it only requires a proposed facility to conduct additional modeling known as a refined analysis. In the refined analysis, the proposed source models the ambient impact of its emissions for comparison to the NAAQS with background concentrations added to the modeled results to demonstrate the applicable NAAQS is not exceeded. Exceeding a SIL also requires the source to define a significant impact area and assess the potential for cumulative impacts.

Since LDEQ is the permitting authority for the State of Louisiana, DOE defers to LDEQ's assessment of the acceptability of the air quality analysis performed by LCCE. LDEQ issued an air permit for the LCCE facility based on an analysis of air quality impacts, including ozone. Future projects in the area will need to address ozone limits at the time of their application through consultation with LDEQ. If future ozone concentration data demonstrate nonattainment in the region, the LDEQ would develop plans and programs to address nonattainment of the ozone NAAQS. An update to the State Implementation Plan for the air quality area would be developed and submitted to EPA Region 6 for review and approval. LDEQ would then implement the control programs which could include requiring stricter emission limits on newly proposed sources (i.e. those not yet permitted) and some level of emission reduction from existing sources.

3 Commenter: John Paul Williams, Gulf Coast Environment and Labor Coalition

Comment 3-1: *I'm referring now to page 4-35 in the Draft Environmental Impact Statement. At that point the Draft Environmental Impact Statement says the mercury will be discharged at 77,000 milligrams per liter. That's two and a half ounces of mercury per liter of discharge water. That's nine ounces of mercury in every gallon of waste water. 1.5 million gallons a day according to the Draft EIS. 800,000 pounds of mercury will be discharged from that facility every day. The same problem with -- the same abrupt and plain miscalculation takes place with regard to copper. Which the Draft EIS at page 4-35 says will discharge 65,000 milligrams per liter. That's literally -- the Draft EIS claims it will be half a million pounds of copper discharged in the waste water every day. These figures deserve an explanation. Either the Draft EIS contains a major error or the plant is permitted to discharge gross and unbelievable amounts of heavy metal into the river. I believe that the Draft EIS is plainly and severely flawed and I am very dismayed that that kind or error would appear in the document and be available to the public for three weeks before a chance to query the experts and have them admit there was a plain flaw in it and yet this document is distributed to the public and paid for with tax dollars. And I would ask that the Draft EIS be withdrawn. That the errors poisoned it. That these errors be corrected. A new Draft EIS be issued, and a new comment period commence.*

Response: DOE acknowledges that there was a typographical error in Table 4.4-5 and it has been corrected in the final EIS. This information was not unique to the draft EIS and the correct limits were published elsewhere. There are no limits for mercury or copper because the LCCE Gasification design includes a zero liquid discharge system and would not discharge process wastewaters. Table 6.4-1 identifies the LPDES permit numbers issued to the LCCE Gasification project: LA0124541 and AI No. 160213 to discharge from the end of Bayou D'Inde Road in Sulphur, Calcasieu Parish, in accordance with effluent limitation, monitoring requirements, and other conditions set forth. LDEQ also issued a public notice for the draft permit for review in the office of Environmental Services Public Notice Mailing List and the American Press on August 4, 2009, prior to issuing the final permit.

DOE regrets the typographical error. A new, draft EIS is not warranted.

Comment 3-2: *The Draft EIS also refuses to study whether the gasification plant will cause or contribute to the local air pollution problems. The Draft EIS claims the plant would cause an insignificant increase in pollution, but at page 4.6, it shows the plant will increase nitrogen oxide levels by .95 and the significant threshold is just 1. So the plant is within a rounding error of causing a significant impact. Likewise, sulfur oxide emissions will increase by over 24 when the threshold is just 25. Let's remember this area's air quality is barely legal. The current ozone concentrations are .073 compared with the legal limit of only .075, as an eight hour average. So just a 3 percent increase in air pollution will cause illegal concentrations of the ozone in the air which will then cause significant and adverse human health problems.*

Response: Please refer to the response to Comment 2-7 for a discussion of air quality and ozone.

Comment 3-3: *Breaking the ozone limit also makes it much harder for new industry to site here and for existing industries to function. If the Draft EIS refuse to study whether this plant in*

combination with the many other new smoke-stack industries that have applications pending will cause that 3 percent increase in ozone levels. While the Draft EIS listed some upcoming projects, the list was painfully incomplete, leaving off the Sasol ethylene crackers and four of the new -- the nearby LNG export terminal projects. And all the Draft EIS did was list those projects without even discussing their cumulative air pollution impacts in combination with the gasification plant.

Response: Issues expressed in this comment with regard to existing ozone levels are addressed in the responses to Comments 2-7 and 3-2. As described in Section 5.2.1, the LCCE Gasification plant would not have an incremental cumulative impact because emissions from the facility are all less than the Significant Impact Levels for all criteria pollutants. Sasol's proposed Westlake Gas-to-Liquids Plant is included in Table 5.1-1 summarizing regional projects identified for consideration in the cumulative analysis. In addition, projects which met the criteria for reasonably foreseeable future development since publication of the DEIS and prior to September 15, 2013 were added to Table 5.1-1 and considered in the cumulative impacts analysis.

Comment 3-4: *The goal of the project is to demonstrate capture of carbon dioxide and the sequestration underground, but the Draft EIS presents many different figures for just how much carbon dioxide the plant will emit from 4 million in the June 2012 announcement to 5.2 million tons on page 4.6 to 5.8 million tons on page 2-42. The Draft EIS claims the plant is designed to capture either 70 percent or 83 percent of the carbon dioxide not saying whether that 70 percent of 5.2 million tons or 83 percent of 5.8 million tons, but it doesn't say how much is actually required to be captured in order to get and keep that 261.4 million in taxpayer money. The Draft EIS has failed to provide a consistent description of the plant's CO_2 emissions, the percentage and tonnages of captured that are possible and percentage and tonnages of captured that are required. The only existing regulatory document governing carbon dioxide right now is the state air permit and it does not require any carbon dioxide capture at all. This is an important issue because even if the plant performs as designed, it will still allow as much carbon dioxide pollution as a medium size power plant.*

Response: The question of emissions is complicated by the range of possible operating conditions. The table below summarizes where CO_2 emissions were identified in the EIS and where changes were made in the final EIS. As described in Section 4.2.2.2.1, the June 2012 LDEQ Air Permit authorizes LCCE Gasification plant to emit 5.8 million tons of CO_2 per year. If the facility operated 100% of the year at maximum load, it would be designed to capture 89% of the CO_2, or 5.2 million tons per year. Actual operations would include load fluctuations, maintenance, and unplanned outages. As such, the facility would be expected to average approximately 4.6 million tons of CO_2 captured per year.

Description of CO_2 During Operation		Calculation	CO_2 Value	Location in EIS	Comments
Total emissions from LCCE Gasification plant and Lake Charles CCS Project, including ancillary sources	A		5,840,387	4.2.2.2.1, 5.2.2	No Change Tons per year from June 2012 LDEQ Air Permit
AGR Design capture, %	B		89	4.2.2.2.1, 5.2.2, 5.2.2.1	No Change
CO_2 not captured, %	C		11	4.2.2.2.1	No Change
CO_2 Captured to CO_2 Compression and Transport	D	= A * B/100	5,200,000	Table 2.5-3	No Change Rounded to nearest 100,000
CO_2 uncontrolled emissions from all sources	E	= A * C/100	642,400	Table 2.5-3, 5.2.2, 5.2.2.1	Section 5.2.2.1 uses 0.63 million and 0.64 million. The reference to 0.63 has been changed to 0.64.
Total CO_2 emissions for 30 year commercial operation (w/capture)	F	= E * 30	19,000,000	5.2.2.1	No Change Rounded to nearest 1,000,000
CO_2 Pipeline	G		Fugitive only	4.2.3.2.1	No Change
Capture and Compression of approximately 4.6 million tons per year of CO_2 emissions at the LCCE Gasification plant	H		4.6 Million	1.4, 2.2, Table 4.16.1	Estimated annual quantity captured averaged over 30 years considering planned maintenance and estimated unplanned outages and load fluctuations.

4 Commenter: Jordan Macha, Sierra Club

Comment 4-1: *One of our major concerns is the ongoing monitoring of the carbon capture and storage. CCS still has yet to be a proven technology on an industrial scale. Experts in the field indicate that the technology for this type of capture and storage is years away. While there are values in saying the efficacy of CCS, that efficacy can only be evaluated if there's rigorous monitoring at every stage of the process including capture at the Lake Charles facility; transportation of the CO_2 and the sequestration. Congress required funds provided by the DOE under this program to be considered on comprehensive monitoring. The Draft EIS fails to adequately outline how DOE plans to conduct monitoring of this project in its entirety. The Draft EIS -- in the Draft EIS, gives information how the storage of the CO_2 in Texas will be monitored but key details about monitoring will be conducted by a third party are incomplete. For example, it is unclear whether that monitoring will last the lifetime of the capture project.*

Response: The monitoring imposed by DOE is not intended to satisfy regulatory requirements, but rather is intended to provide operational, technical, and financial data for the purpose of advancing the science of CO_2 and fulfilling DOE's core objectives. Monitoring for regulatory

purposes will be done by the responsible parties at the locations and with the frequency specified by the regulatory authorities.

Section 703 of the Energy Independence and Security Act of 2007 (Pub. L. 110–140),directed DOE to "carry out a program to demonstrate technologies for the large-scale capture of carbon dioxide from industrial sources." Section 702 further provided guidance to DOE under Section 702(c) by providing significant programmatic authorizations for, among other things, "Field Validation Testing Activities", involving carbon dioxide injection and "monitoring, mitigation, and verification operations in a variety of candidate geologic settings, including….operating oil and gas fields." There is no statutory requirement for DOE to impose CO_2 monitoring requirements at other points in the project, such as at the industrial source.

Regardless, DOE did require capture monitoring in the FOA. Please refer to the response to Comment 2-5 for a discussion of capture monitoring and reporting requirements.

Comment 4-2: *Oil field sequestration of CO_2 is a relatively proven method as enhanced oil recovery has been utilized for decades. It is therefore unclear to us why DOE should dedicate scarce federal research funds for this project.*

Response: DOE funds a portfolio of large volume research and demonstration projects involving various technologies and different geologic structures and areas, and demonstrating new monitoring techniques beyond the current standard methods. When combined, this portfolio is meant to give a comprehensive picture of the sequestration potential of the US. In addition, by providing financial assistance to such projects, DOE hopes to demonstrate that similar ventures can be commercially viable in the future without government assistance. The Lake Charles CCS project contributes significantly to this portfolio in several ways, including the large volume of CO_2 stored (approximately 5 million tons/year), the research MVA techniques being developed by Denbury, and the demonstration of the large scale integration of the specific capture, compression, and storage technologies employed.

An added benefit is that the proposed project would use CO_2 captured from an industrial source rather than naturally-occurring CO_2 from underground formations. CO_2 reservoirs are not substantially different to conventional natural gas reservoirs. The gas collects in structures capable of trapping low-density fluids (NETL 2012). As described in Section 2.3.2.3, CO_2 for enhanced oil recovery was used in 80 oil fields in the U.S. in 2008, including 45 sites in Texas. Currently, the majority of CO_2 injected for EOR is naturally occurring CO_2 obtained from geologic formations, including Denbury's operation interests in Jackson Dome, Mississippi. A 2008 study by INTEK for DOE concluded that as much as 30 trillion cubic feet of CO_2—or 5 billion cubic feet per day at peak rates of injection—could ultimately be stored, with a resulting incremental increase in U.S. oil production of 5.5 billion barrels over 25 years (NETL 2010). The proposed project would reduce the need to use naturally occurring CO_2 for these operations, while providing additional, unique data on the effectiveness of CO_2 sequestration in EOR operations, helping to firmly establish the commercial viability of anthropogenic CO_2 capture and sequestration in EOR operations.

References:
National Energy Technology Laboratory (NETL). 2012. Natural CO_2 Reservoirs on the Colorado Plateau and Southern Rocky Mountains:
Candidates for CO_2 Sequestration. Department of Energy Grant DE-FC26-00NT4096, undated. Available at: http://www.netl.doe.gov/publications/proceedings/01/carbon_seq/6a2.pdf. Accessed on October 22, 2013.

National Energy Technology Laboratory (NETL). 2010. Carbon Dioxide Enhanced Oil Recovery. Available at: http://www.netl.doe.gov/technologies/oil-gas/publications/EP/CO2_EOR_Primer.pdf. Accessed on October 3, 2013.

Comment 4-3: *The Draft EIS also contains insufficient information about who or how the information of capture of carbon from the facility in Louisiana will be monitored. The capture of -- it's imperative that DOE outline to the public how they plan to monitor the capture of CO_2 long-term. In the current draft, the language is vague at best.*

As Louisiana and the central Gulf Coast for that matter is really the ground zero for the impact of climate change, it's critical that DOE provide details how they plan to monitor the capture of carbon and the ramifications if Leucadia does not meet minimum expectations.

Response: Issues expressed in this comment regarding monitoring requirements are addressed in the response to Comment 2-5.

Comment 4-4: *Further in the Draft EIS, it is unclear how much carbon is Leucadia required to capture and sequester if any. So with the monies that are being provided that were provided by Congress for this industrial carbon capture and storage program, there are minimum requirements such as how many limiting of green gases and combating climate change, comprehensive measuring, monitoring and validation, job creation and job recovery promotion.*

Response: Issues expressed in this comment regarding the amount of CO_2 captured and sequestered are addressed in the response to Comment 2-5. Section 4.9 discusses socioeconomic impacts, including job creation and other economic impacts.

Comment 4-5: *Under the guidelines of limiting greenhouse gasses and combating climate change, the DEIS fails to fully articulate the net environmental harm.*

Response: As a result of this and similar comments, DOE completed a Green House Gas life-cycle analysis (GHG LCA) for the proposed project and its connected action to assess emissions of GHGs. This analysis is presented and discussed in Section 4.2.5 of the final EIS.

Comment 4-6: *The air permit issued by the state currently as it is does not require Leucadia to capture any of its CO_2. As described above -- I'm going to submit these.*

As I described earlier DOE fails to adequately outline how the capture of CO_2 will be monitored, while not sufficient. Should Leucadia not capture any of its carbon or stop capturing after a certain date, it would be the largest point source of carbon in the state. The evaluation of

climate change impacts in the Draft EIS assumes that the capture system will operate for the lifetime of the project but there is no apparent and forceful requirement for continued operation.

Response: DOE has reviewed the design of the plant, as well as the economic model set forth by Leucadia with respect to capture of CO_2. The project design as proposed to DOE includes carbon capture as an integral component. In fact, the production of methanol requires the separation of CO_2 from the gas stream. This high purity CO_2 could be sold or vented under the conditions of the current LDEQ air permit. DOE anticipates that the CO_2 stream will be sold. Given the value of the CO_2 produced by this project due to its purity, it would not make economic sense to vent it to the atmosphere. The economic model confirms that CO_2 revenue is important to the profitability of the plant. DOE has knowledge of a signed CO_2 off-take contract between Leucadia and Denbury, independent of the proposed DOE action, which represents a legal obligation on the part of both parties to engage in the sale of the CO_2 from this plant. For these reasons, DOE believes that the recipient choosing to intentionally vent the CO_2 output of the plant during normal operations is not a realistic scenario. However, DOE cannot mandate the capture and/or storage of CO_2 after DOE's involvement ends.

This project is part of a demonstration program which would integrate CO_2 capture technology with other plant processes, and DOE acknowledges that the technology may not function as designed. As a result, the evaluation of GHG emissions in the EIS includes both the expectation that the capture system will operate for the lifetime of the project and that no capture may occur. Although a scenario of no capture of CO_2 is unlikely, DOE analyzed these potential effects as part of no action sub-alternative 2 in Section 4.16.2 and Table 4.16-1. Under this alternative, the LCCE Gasification plant would be built, but the captured CO_2 would be vented to the atmosphere and not sequestered in an ongoing EOR operation.

Comment 4-7: *This also is a highly speculative project. To date, Leucadia has changed its gasification project more than once because it has been unable to find buyers, making job creation and retention uncertain.*

Response: The proposed project is a large-scale industrial carbon capture and storage project on the Gulf Coast producing valuable industrial chemicals from petroleum coke. DOE selected the project based on the requirements of the Funding Opportunity Announcement (FOA). The proposed project evolved to the production of alternative industrial chemicals (methanol and hydrogen) based on its successful negotiation of financeable, long-term commercial contracts. The change in products reflects the demand and the negotiated contracts for these products. With off-take agreements in place, DOE expects the project would create and retain jobs.

Comment 4-8: *In addition to the production of CO_2 not captured or sequestered, the transportation of chemicals and materials used for production, the making of petroleum coke, the transfer of product and the large amount of energy needed to run the facility, and the CO_2 used for enhanced oil recovery of crude oil which in and of itself is a major source of climate change pollution, discounts the environmental benefits of the project.*

Response: As a result of this and similar comments, DOE completed a Green House Gas life-cycle analysis (GHG LCA) for the proposed project and its connected action to assess emissions of GHGs. This analysis is presented and discussed in Section 4.2.5 of the final EIS.

As described in Section 4.2.5, the CO_2 which occurs upstream of the LCCE Gasification plant, such as emissions from the petroleum extraction and refining processes resulting in the pet coke, the production of ammonia, extraction of natural gas and mining of limestone, is outside the scope of the EIS since they are commodities (or byproducts) produced and sold into a commercial market. The production of these items occurs independently of the project and DOE's decision on the proposed action. Similarly, the LCA analysis does not include emissions from use of products from LCCE Gasification, specifically the CO_2 emissions that would occur from the use of the methanol, sulfuric acid, or oil produced by EOR. The LCA includes the GHG emissions from indirect sources such as the transportation of feed materials, electricity generation, worker commutes, and product transportation.

Additionally, DOE compared the LCA for the proposed project and connected LCCE Gasification against the GHG LCA for conventional production methods of the same quantities of methanol (steam reformation of natural gas), hydrogen (pressure swing absorption), and sulfuric acid (combustion of elemental sulfur and catalysis reactions). This business-as-usual case also assumed the continued export of petcoke overseas to be combusted where emissions regulations are not as stringent as the U.S., instead of being used as a feedstock at the LCCE Gasification plant. Additionally, the CO_2 for EOR in the business-as-usual scenario was assumed to be produced from a naturally-occurring source.

Although outside the scope of the EIS, the total GHG footprint of the LCA was used, including the emissions assigned to the production of petcoke, ammonia, natural gas, and limestone. Those emissions were included in order to make an accurate and equivalent comparison against the business-as-usual case. The LCCE Gasification plant captures CO_2 and prevents long distance transport of exported petroleum coke, making its life cycle GHG emissions 56 percent lower than the business-as-usual scenario.

Since DOE has no data on the planned disposition of the various products of the plant by the purchasers, DOE made reasonable assumptions about the distances of product shipment. Methanol, in particular, experiences global demand, and could be shipped any distance. DOE ran an additional scenario in which the methanol product was shipped to China, and the emissions from the transport of methanol increased the annual GHG emissions from the plant life cycle to 3.5 million short tons per year -- this is 33 percent higher than the LCCE Gasification plant scenario with domestic distribution, but still 42 percent lower than the business-as-usual scenario.

Comment 4-9: *The DEIS fails to adequately account for the existing environmental justice issues in the surrounding area and does not sufficiently examine the cumulative impacts of the other industrial projects slated for the area. This includes examining the cumulative impacts of air pollutants and other criteria pollutants that this facility will generate and how this will impact the surrounding community. We thank you for allowing for the public to comment on this project and we urge DOE to provide a more thorough examination and explanation of the measuring and monitoring process of CO_2 capture and sequestration at the Lake Charles site. In addition, further study into the environmental justice impacts to this area is crucial. Louisiana has long been a sacrifice state for this nation but it's time that we comprehensively look at the impacts to the people, and communities and environment of both Louisiana and Texas before funding a risky project with federal funding.*

Response: Issues expressed in this comment related to environmental justice are addressed in the response to Comments 8-18 and 8-19. Issues expressed in this comment related to CO_2 monitoring are addressed in the response to Comment 2-5.

5 Commenter: Michael Dees, Port of Lake Charles

Comment 5-1: *The port has been a major industry assistance to growth and employment in the area since that time with about 35 different projects totaling about a billion two hundred thousand dollars in investment and thousands of jobs.*

Response: Thank you for your comment.

Comment 5-2: *The project will represent a tremendous positive investment in the community. It is a win, win, win in terms of economic investment, jobs, and an assistance to the environment.*

Response: Thank you for your comment.

Comment 5-3: *No one has mentioned here the fact that petroleum coke will be produced. It's going to be produced. It's been produced for years and years and it's being burned in steel mills and other industries around the world producing pollution. This company has found a way through new technology to capture those pollutants and use them in an economically and environmentally friendly way.*

Response: Thank you for your comment.

Comment 5-4: *One key factor, I think that's been missed by some of the opponents is that the project which is located on 70 acres of Port-owned property. I drafted the lease as I've done probably hundreds of times, and not only will the company be mandated by state and federal law to comply with all of the environmental rules and regulations and ensure that they're totally in full compliance with those laws, but the lease itself gives the Port Authority the right to evict them or end the lease if there's any violations. So they put at risk everyday 2.6 billion in investment if they violate any of the environmental regulations.*

Response: Thank you for your comment.

6 Commenter: Ann Barilleaux, Southwest Louisiana Economic Developmental Alliance.

Comment 6-1: *We are very supportive of the project because it will bring economic development and growth opportunities not only to Calcasieu Parish, but the effects that have been seen throughout our region. We will have more economic businesses, more jobs for our workers and just growth for our community as a whole. And one thing I would like to also note that our industries have been working very diligently to make efforts to clean and enhance and really protect the environment, and they provide information for public education as well. And*

this project is on the technological leading edge of that and that is very important for our community.

Response: Thank you for your comment.

7 Commenter: Hal McMillin, Calcasieu Parish Police Jury, District 14

Comment 7-1: *First off, the Calcasieu Parish Police Jury has sent a resolution of support on behalf of this project. We feel as a Police Jury this is a great project for Southwest Louisiana. We know we have been working on this project for a number of years.*

Response: Thank you for your comment.

Comment 7-2: *One of the things that Leucadia has come to us and done and kind of pledged to us in Southwest Louisiana is to use local contractors and that's very important to use our local contractors. To feed our families right here in Southwest Louisiana that's tremendous. They've come up with this idea. It was their idea and believe me they've stood by this idea.*

Response: Thank you for your comment.

Comment 7-3: *I truly believe we have room for growth in Southwest Louisiana. Although we're looking at an opportunity of approximately 40 billion dollars' worth of growth in this area. This project here has been on the books for seven years. We're excited about it. A two and a half billion dollar project in Southwest Louisiana is something that's going to be good for our economic development and for our economy.*

Response: Thank you for your comment.

Comment 7-4: *I have a lot of faith in our EPA and LDEQ to make sure that this project is safe and clear. I also have a lot of faith in the folks at Leucadia. They're going to make sure that our environment is protected. So I'm very happy about this.*

The last time to finish up with. Any time that you get matching funds from a federal group and bring it to Southwest Louisiana, I'm thrilled about that opportunity. Please fund this project. Please make this happen in Southwest Louisiana.

Response: Thank you for your comment.

8 Commenter: Casey Roberts, Sierra Club Associate Attorney

Comment 8-1: *The Draft Environmental Impact Statement for the Lake Charles Carbon Capture and Sequestration Project (DEIS) is legally and technically flawed because the project, as described, will not fulfill the stated purpose and need, and the DEIS fails to adequately assess all of the direct, indirect, and cumulative impacts of the project. Among other failures:*

- *The DEIS fails to thoroughly discuss one of the most critical aspects of the capture and sequestration program—the monitoring of both the captured and stored carbon dioxide (CO_2)—therefore failing to ensure that this project will "demonstrate technologies for the large-scale capture of CO_2 from industrial sources," as required by Congress.* [Refer to Comments 8-2 through 8-7]
- *The climate impacts of the proposed action are not fully acknowledged due to ambiguities in the DEIS about how much carbon will actually be produced, captured, and sequestered.* [Refer to Comments 8-9 through 8-17]
- *The DEIS fails to adequately assess the potential harms from water use, flood risks that accompany this project, and the destruction of wetlands from this project.* [Refer to Comments 8-20 through 8-33]
- *The DEIS fails to adequately address the real and severe environmental injustices already occurring in the Lake Charles community and the cumulative impact of the LCCE Gasification Plant and other existing and future projects will have on this community.* [Refer to Comments 8-18, 8-19 and 8-22]
- *The DEIS has arbitrarily constrained the alternatives to the proposed project by evaluating only a "no action" alternative, although nothing in the statute creating this demonstration program prohibits the DOE from placing a second request for bids for projects that better match the goals of section 703, namely the mitigation of greenhouse gases from the atmosphere.* [Refer to Comments 8-34 and 8-35]

Accordingly, the Sierra Club requests that DOE conclude that the Lake Charles CCS project will cause significant and irreparable environmental harm, and reject the project. Alternatively, we request that DOE fully and completely address the following concerns and re-issue the DEIS for further public comment.

Response: This comment provides a summary of issues raised in the balance of comments provided by the commenter. DOE addressed these issues individually in the responses to Comments 8-2 through 8-34, as indicated above.

In accordance with 40 CFR 1502.9, DOE finds that there are no changes to the proposed action or "significant new information relevant to environmental concerns" to warrant a supplemental draft EIS.

Comment 8-2: *To demonstrate the effectiveness of the overall CCS project, there must be comprehensive and rigorous monitoring and reporting at every stage of the process. There is no information provided about monitoring or reporting for the capture and transportation stages, and the monitoring program for the sequestration stage applies only to one of the sequestration sites and omits key details. A comprehensive monitoring plan must include planning, development and implementation. This includes: (1) establishing the goals of the monitoring program, (2) who will collect the data, (3) what data must be acquired in order to meet the established goals, (4) how often this data will be collected, (5) the tools and techniques used for monitoring, (6) the performance standards required to collect accurate data, (7) the use of strong and effective enforcement to ensure the data will be collected and that it will be collected accurately, (8) an action plan if the monitoring is not meeting the established goals, and (9) a reporting plan that establishes the type of data that should be reported, the frequency of the reports, and a mechanism to enforce the reporting plan. The DEIS fails to lay out any*

comprehensive monitoring plan and therefore funding the Lake Charles CCS project will not fulfill DOE's statutory requirement to demonstrate technologies for large-scale carbon capture.

Response: The nine factors that the commenter lists as desirable components of a comprehensive monitoring program do not have any basis in the statutory authority or FOA under which this project was funded. The monitoring imposed by DOE is not intended to satisfy regulatory requirements, but rather is intended to provide operational, technical, and financial data for the purpose of advancing the science of CO_2 and fulfilling DOE's core objectives. Monitoring for regulatory purposes will be done by the responsible parties at the locations and with the frequency specified by the regulatory authorities. Please refer to the response to Comment 2-5 for a discussion of DOE's monitoring and reporting requirements for the project.

Comment 8-3: *The DEIS states that the goal of the program is to provide "an accurate accounting of approximately 1 million tons of stored CO_2, and a high level of confidence that the CO_2 injected will remain permanently sequestered." DEIS at S-4 (emphasis added). However, the DEIS fails to describe any comprehensive program to actually meet this goal. The current operator of the West Hastings oil field, Denbury Onshore, is already using compressed CO_2 for enhanced oil recovery, and currently monitors that process as needed for commercial and regulatory purposes. The DEIS states that Denbury and the Texas Bureau of Economic Geology would develop and implement a new monitoring program, referred to as the West Hastings Research monitoring, verification and accounting (MVA) Program. DEIS at xxviii. While the DEIS describes many techniques and tools the MVA program will use to monitor the sequestered CO_2 (see e.g., DEIS at 2-25), it does not establish the length of the monitoring program and the frequency of the monitoring, two details that are critical to demonstrating that a project like the permanent sequestration of 4.6 million tons of CO_2 can successfully be achieved. The DEIS fails to provide any hint as to how long the monitoring of the area will continue, including only vague language such as "ongoing" and "continuous." DEIS at 4-22 and S-19. The most definite description of the length of the research activities cited by the DEIS is "over two years." DEIS at 2-26. Where the stated goal is to demonstrate "permanent" sequestration of carbon, this indication that monitoring might last as little as two years raises serious concerns that the purpose of the project will not be fulfilled. Moreover, the indefinite description of the duration of the monitoring period suggests that DOE is not even aware of how long the MVA program will last. Without a commitment to monitor for decades or evidence that two years of sequestration somehow ensures "permanent" isolation from the atmosphere, the proposed action will be unable to demonstrate the commercial feasibility of sequestration as is statutorily required. 42 U.S.C. § 16293(c)(3)(A). Furthermore, DOE relies on a statement from Denbury that "a de minimis amount of the CO_2 processed is emitted to the atmosphere," DEIS at 2-22, but it is unclear whether the MVA will involve any monitoring of leakage prior to injection of CO_2. This data gap could seriously undermine the validity of any monitoring results. Finally, it is unclear whether the monitoring will be installed early enough to begin collecting the data necessary to establish baseline conditions. Without solid data regarding the baseline conditions of the aquifer and other geological layers, the resulting analysis may be compromised.*

Response: The commenter identified two types of monitoring issues in this comment: monitoring for regulatory agencies and the research MVA program co-funded by DOE. Denbury is required by the terms of their Class II permit to submit standard, commercial monitoring data to the Texas Railroad Commission for the life of any EOR operations at the field. (Similar requirements exist for any commercial EOR operation Denbury is involved in at any other field.)

Section 2.3.2.3 describes the requirements for obtaining the Class II permit. Section 2.3.2.3 includes additional information on the regulatory requirements for monitoring Class II wells during operation. Table 2.3-2 of the EIS provides a detailed comparison of Denbury's existing commercial monitoring activities and the supplemental West Hastings research MVA program. The commercial monitoring would be supplemented by the research MVA activities, which focus on prevention (well integrity) and detection (above zone monitoring, soil gas monitoring, and fault monitoring) of potential leak pathways. By supplementing the commercial monitoring activities, the research MVA techniques will provide valuable data on subsurface movement of CO_2, advance the science of CO_2 sequestration in accordance with DOE's objectives, and give a high level of confidence that the CO_2 will remain permanently sequestered.

Under the terms of the Cooperative Agreement, data from the West Hasting Research MVA activities will be reported to DOE on a monthly basis for approximately 2 years. Although DOE would welcome the opportunity to analyze data over a longer period, the CA sets forth the negotiated monitoring period. Should these research MVA activities prove useful at prevention and detection of leak pathways, Denbury may choose to continue gathering such data in the future, on this and other commercial projects. Additionally, since the data regarding the research MVA will be publicly available in the final topical report, these techniques could be adopted by other entities engaged in similar activities. Should the additional research MVA data not prove useful, Denbury will still have to report the commercial well monitoring data to the appropriate regulatory authorities. The Texas Railroad Commission has regulatory authority under the federal Underground Injection Control Program.

The Bureau of Economic Geology began the baseline monitoring at the West Hastings field in 2011.

Comment 8-4: *The sequestration monitoring described in the DEIS is limited to three acres at the West Hastings oil field injection site. Apparently, there are no plans to monitor at any of the other oil fields where CO_2 captured at Lake Charles CCS will be injected. DEIS at S-4. This is a missed opportunity for DOE to assess how well CO_2 is sequestered through EOR in a range of locations, not just at one, hand selected oil field that may not have representative geological conditions.*

Response: The CO_2 used by Denbury in their ongoing EOR operations throughout the Gulf Coast is subject to Class II monitoring well requirements, as described in Section 2.3.2.3 and the response to Comment 8-3. The West Hastings research MVA program would use additional techniques to provide supplemental information about the movement of CO_2 within the subsurface formations.

In total, DOE's programs are monitoring sequestration in multiple projects, at multiple locations, and across many types of formations. This project provides one piece of the total U.S. sequestration potential, demonstrates new monitoring techniques, and results in the sequestration of CO_2 through ongoing commercial EOR. A 2008 study by INTEK for DOE concluded that as much as 30 trillion cubic feet of CO_2—or 5 billion cubic feet per day at peak rates of injection—could ultimately be stored, with a resulting incremental increase in U.S. oil production of 5.5 billion barrels over 25 years (NETL 2010).

References:
National Energy Technology Laboratory (NETL). 2010. Carbon Dioxide Enhanced Oil Recovery. Available at: http://www.netl.doe.gov/technologies/oil-gas/publications/EP/CO2_EOR_Primer.pdf. Accessed on October 3, 2013.

Comment 8-5: *Even if the monitoring program described by the DEIS were sufficient to demonstrate that the sequestered CO_2 was permanently stored, the DEIS completely fails to describe the monitoring at the LCCE Gasification Plant. The statute requires monitoring not just of the success of the sequestration stage of the project, but also of the capture stage. See 42 U.S.C. § 17251. The entirety of the DEIS discussion on capture monitoring follows: Leucadia would provide DOE with information necessary to determine whether the commercial-scale technology operations at the LCCE Gasification Plant are making progress toward the capture and sequestration of 75% of the CO_2 from the treated stream, comprising at least 10% of CO_2 by volume, which would otherwise be emitted to the atmosphere.*

Response: Issues expressed in this comment regarding monitoring of CO_2 are addressed in the response to Comments 2-5 and 4-1. A detailed discussion of the statutes which govern DOE's program was also added to Section 1.1.1 of the EIS.

Comment 8-6: *There is no information about how capture monitoring will take place, how often the capture monitoring data would be reported to DOE, what "necessary" information the DOE requires, and how the DOE would enforce the provision of information if Leucadia fails to follow through. Nor is it apparent that Leucadia or the vendors of the equipment used in the capture and compression processes would not consider capture rate, cost, and operational information to be proprietary, and withhold it from the public. A fair reading of the DEIS suggests that the Lake Charles CCS project is completely lacking a comprehensive monitoring plan and therefore cannot demonstrate the large-scale capture of CO_2.*

Response: Issues expressed in this comment are addressed in the response to Comment 2-5.

Comment 8-7: *Similarly, the DEIS give little to no attention to monitoring the transport of CO_2 through several hundred miles of pipeline. According to the DEIS, Denbury will monitor the pressure in the pipeline, DEIS at 2-19, but it is unclear whether the results of this monitoring will be reported to DOE, or whether the quality and sensitivity of the data produced through Denbury's monitoring, which is presumably undertaken for operational and safety purposes, is adequate for the research and verification standards established by Congress. The transmission of millions of tons of CO_2 over hundreds of miles is a critically important aspect of the Lake Charles CCS project and has the potential to release millions of tons of CO_2 into the atmosphere. Therefore, like the LCCE Gasification Plant and the EOR sequestration sites, there must be a comprehensive monitoring plan in place for the pipeline. Without a comprehensive description of the monitoring plan the public cannot be accurately informed of the project's effectiveness. It must therefore be assumed that there is in fact is no comprehensive monitoring plan for this project and it will violate its statutory mandate to demonstrate the large-scale capture of CO_2.*

Response: As described in Section 1.5, the Green Pipeline is a privately-held, existing and operating commercial CO_2 pipeline. The Green Pipeline is not the subject of any DOE funding action, nor is it a connected action because it is currently operating and not dependent upon the

proposed project. DOE's decision with respect to the proposed project would not affect operations of the Green Pipeline; therefore, its operations are not evaluated in this document. Only the 11.9-mile CO_2 pipeline is considered within the scope of the EIS. The 11.9-mile pipeline would be monitored in accordance with standard practices described in Section 2.3.2.3. DOE and Denbury evaluated the potential for accidents along the 11.9-mile new pipeline in Section 4.15.3.2, including a worst-case release scenario.

Comment 8-8: *In contrast, the DEIS considers the enhanced oil recovery activities at West Hastings and elsewhere on the Texas Gulf Coast not to be within the scope of the DEIS because that oil recovery would occur regardless of this project. DEIS at 1-6. However, by funding the Lake Charles CCS project, DOE is creating a significant new source of pure, compressed CO_2 that is suitable for enhanced oil recovery, a resource that is otherwise obtained by drilling into natural formations such as the Jackson Dome. This project also involves the construction of a new CO_2 pipeline that will connect the ICCS Gasification Plant and other industrial sources of CO_2 in Louisiana to an existing CO_2 pipeline. According to a 2010 DOE report on carbon dioxide EOR, "the single largest project cost [for EOR] is the purchase of CO_2," and "[t]otal CO_2 costs . . . can amount to 25 to 50 percent of the cost per barrel of oil produced."1 This report states that reducing the costs of CO_2 and providing a definite supply would improve the "economic margin essential for justifying this oil recovery option to operators who still see it as bearing significant risk." Undeniably then, this project is expanding the supply of compressed, pure CO_2 and providing new infrastructure that will ensure continued supply, which will make it more economical for Denbury Onshore and other oil field operators to undertake enhanced oil recovery. Therefore, the effects of any EOR activity undertaken with CO_2 captured at the LCCE Gasification Plant, or transported through the new 11.9 mile pipeline, must be considered in a revised and reissued EIS.*

Response: As discussed Section 1.5 of the EIS, the EOR activities are outside the scope of the EIS. DOE agrees that a successful demonstration of this project could have indirect and cumulative impacts on the regional economy. The proposed research MVA program could have positive impacts of helping to ensure the long-term economic and financial viability of CO_2 capture activities by confirming storage of CO_2 injected during EOR operations. Information collected during the research MVA program would provide additional, unique data on the effectiveness of CO_2 sequestration in EOR operations. The data could help firmly establish the commercial viability of CO_2 capture and sequestration in EOR operations throughout the Gulf Coast region. This potential impact is discussed as part of the cumulative impacts analysis in Section 5.3.4.

As described in Section 2.3.2.3, CO_2 EOR was used in 80 oil fields in the U.S. in 2008, including 45 sites in Texas. Currently, the majority of CO_2 injected for EOR is naturally occurring CO_2 obtained from geologic formations, including Denbury's interest in operations at Jackson Dome, Mississippi. Furthermore, issues raised with respect to the economic benefit of using commercial, as opposed to naturally occurring CO_2, are described in the response to Comment 4-8 and are discussed in the business as usual scenario in Section 4.2.5.

Comment 8-9: *The Lakes Charles CCS project is enabling the construction of a major new industrial source which, "operating at full capacity, is permitted to emit 5,840,387 tpy of CO_2 equivalents (CO_2e) per year."3 DEIS at 5-19. The DEIS asserts that there will be minimal climate impacts because 89% of the CO_2 produced by the project will be captured, DEIS at 5-18,*

but this analysis is inadequate and misleading. The DEIS fails to accurately describe the amount of CO_2 that this project will produce, the potential implications from less than 89% capture, and the cumulative impacts the project will have on climate change.

The DEIS asserts that 89% of the CO_2 produced will be captured, but does not describe what activities the DOE counted toward the project's CO_2 emissions. Even the CCS project successfully captured 89% of the gasification process stream, there are many other sources of carbon emissions associated with this project. This is a significant defect of the DEIS considering the fundamental purpose of the project and DOE's statutory authority for providing financial incentives.

Response: As described in Section 1.3, the purpose of the proposed project is to demonstrate "the next generation of technologies that will capture CO_2 emissions from industrial sources and either sequester or beneficially use the CO_2." Demonstrating successful integration of acid gas removal (AGR) technology with compression and storage in a large-scale industrial facility is an objective of the proposed project. Section 2.5.2 has been updated to state that the proposed project would capture CO_2 only from the gasification process, specifically from the AGR equipment. The proposed project is not designed to capture carbon emission from any other technology or equipment.

The issues raised in this comment with respect to the quantity of CO_2 emissions from direct and indirect sources associated with the proposed project and connected action are addressed further in the responses to Comments 4-5 and 4-8 Section 4.2.5 of the FEIS. The cumulative impacts of this project on climate change are addressed in Section 5.2.2. Issues expressed regarding analysis of zero percent capture are addressed in the response to Comment 4-6 and in Section 4.16 of the EIS.

Comment 8-10: *The DEIS states that the plant is permitted to release over 5.84 million tons of CO_2 annually at full capacity. DEIS at 5-19. The DEIS notes that emissions from diesel tugs used to bring in petroleum coke would be responsible for another 5,000 tons per year. Yet, the DEIS Fails to account for All of the potential sources of CO_2 emissions from the Lake Charles CCS Project such as:*

- *Burning the 175 gallons of fuel per day that the DEIS estimates will be used for vehicles and equipment at the facility. DEIS at 2-37*
- *Moving the 8-10 trucks and the 6-8 railcars needed every day to ship the methanol that will be produced by the LCCE Gasification Plant. Id.*
- *The 10-30 barges needed every month to ship the methanol to be produced. Id.*

Additionally, it is not clear whether the estimated 80 MW of energy needed for the facility includes the energy needed to transport the CO_2 from Lake Charles to the West Hastings Oil Field, over 200 miles away, or if that would require additional energy and therefore generate further CO_2 emissions. If not, DOE must add these to the CO_2 emissions that will be released as a result of this action, and analyze their impact on the climate.

Response: Issues expressed in this comment also are addressed in the response to Comment 4-5 and 4-8. As a result of this and similar comments, DOE completed a Green House Gas life-cycle

analysis (GHG LCA) for the proposed project and its connected action to assess emissions of GHGs. This analysis is presented and discussed in Section 4.2.5 of the final EIS.

The LCA includes use of fuel at the facility and to transport products. The on-site combustion of 175 gallons of fuel per day accounts for 0.03% of the total annual emissions. The transport of the methanol product via truck, rail, and barge accounts for 3.07% of the total annual emissions.

Section 2.3.2.1 states that the LCCE Gasification plant includes CO_2 compressors, transport of CO_2 in the 11.9 mile pipeline, and connection to the existing Green Pipeline. With respect to the energy needed to operate, Section 2.5.2.1 states that the power requirements for the CO_2 compressors are included in the 80 MW of electrical power that would be purchased from Entergy. Although the existing Green Pipeline is outside the scope of the EIS (refer to section 1.5), DOE analyzed the energy needs of the entire distance to West Hastings. Based on the CO_2 flow rate, the inlet pressure (2,250 psig), the diameter of the pipeline, and the pipeline distance, DOE determined that additional compression of the CO_2 stream is not necessary to maintain the CO_2 as a supercritical fluid from the site to the West Hastings Oil Field. Therefore, no additional CO_2 emissions need to be accounted for the transport of CO_2 to West Hastings.

Comment 8-11: *There are two major sources of CO_2 emissions associated with the overall project that the DEIS failed to analyze at all—the downstream emissions associated with the products and byproducts of gasification. The LCCE Gasification Plant's main purpose is to produce methanol. The DEIS does not discuss what will be done with the methanol produced at the LCCE Gasification Plant, and it is possible that the end use of this product is not yet known to Leucadia. Because of the possibility that the methanol will be combusted for electricity or as a transportation fuel, the DEIS should evaluate the CO_2 and other environmental impacts of the product of the LCCE Gasification Plant being used as a fuel.*

Response: The potential emissions from downstream activities were not included in the EIS largely because they are not relevant to the analysis. Potential downstream users would be using methanol with or without this project. Similarly, there is sufficient supply of the products and by-products of gasification such that the purchase and use is not dependent on this project. As such, including downstream emissions associated with other facilities using generated products is unrelated to the proposed action and not within the scope of the EIS.

The DEIS notes in Section 2.3.1.1 that the LCCE Gasification plant will produce AA grade methanol. Leucadia would sell the methanol under long-term contract to BP Products North America and other commercial entities. Methanol is used as a feedstock for other chemicals and products. The DEIS states in Section 2.5.1, that the gasifiers would be started using methanol to minimize SO_2 emissions. The hydrogen produced by LCCE Gasification Plant would be sold to Air Products under long-term contract and Air Products will in turn provide that hydrogen to its customers on the Gulf Coast. The sulfuric acid produced by LCCE Gasification Plant would be sold to a large commodities trader. Sulfuric acid is used as a process chemical (acidulating agent, catalyst, dehydrating agent). The fertilizer industry accounts for the majority of sulfuric acid demand with the balance absorbed by oil refinery alkylation, metals production and general chemical applications. The evaluation of the possible end uses of the products of the LCCE Gasification plant and the associated CO_2 emissions is highly speculative, and beyond the scope of the EIS.

Comment 8-12: *The DEIS fails to consider the CO_2 that will be emitted from burning the oil that will be recovered from the West Hastings Oil Field and other EOR operations. The amount of oil that will be recovered using CO_2 captured at the LCCE Gasification plant is not estimated in the DEIS. At just the West Hastings field, Denbury estimates that it could recover 60-90 million more barrels of oil that it previously could not have recovered from this and other EOR projects. DEIS at 2-22. If 90 million barrels were recovered and burned, almost 380 million more tons of CO_2 would be released into the atmosphere.*

Response: As discussed in Section 1.5.3, the commercial EOR operation at West Hastings Oil Field is not the subject of any DOE funding action, nor is it a connected action, since it is an existing, operating, and independent project. Injection rates and production volumes would not change as a result of the proposed project and the DOE's decision on the proposed action; therefore, the commercial EOR operations are not evaluated in this document. Since the oil produced through the commercial EOR activities would be produced with or without DOE's involvement, the produced oil is similarly out of scope. The cumulative impact of encouraging EOR in other locations through the successful demonstration of this technology is discussed in Section 5.3.4

Comment 8-12a*: As discussed above, the impacts of EOR activity are indirect effects of the proposed action and must be evaluated as part of the project's overall impact. The assertion in the DEIS that the EOR operations, including injection rates and production volumes, will not change in the slightest due to the proposed action is simply not supportable. It seems very likely that the CO_2 to be generated from burning the methanol and oil from this project will negate the climate benefits of capturing carbon produced in the gasification process. The fact that the DEIS fails to acknowledge these additional sources of CO_2 emissions as impacts related to the project is highly problematic. The DEIS's omission of these CO_2 emissions defeats the very purpose of NEPA: to inform the public and decision-makers of the environmental consequences of a proposed action.*

Response: The issue raised regarding the impacts of EOR is addressed in response to Comment 8-8. As discussed in Section 1.5 of the EIS, the EOR activities are outside the scope of the EIS.

Comment 8-13: *A critical flaw with the DEIS analysis is its assumption that 89% of the CO_2 produced at the Lake Charles Plant will be captured and sequestered. DEIS at S-19. This assumption is unsupportable for several reasons. First, there is no enforceable requirement for the facility to capture any CO_2 at all. Id. If the capture system does not work as planned, or the demand for compressed CO_2 declines precipitously, Leucadia could apparently vent its CO_2 stream to the atmosphere after passing it through the regenerative thermal oxidizer. If recipients of these DOE funds must operate the capture system for a minimum period of operation as a condition of receiving federal funds, it is not evident from the DEIS. Second, although 89% capture is the goal of the project, the DEIS recognizes that the actual capture rate could be lower. DEIS at S-15. This would be a disappointing result of the demonstration project, but more critically, would mean significantly higher volumes of CO_2 being emitted. The DEIS must evaluate the climate implications of zero percent capture.*

Response: Issues expressed in this comment regarding monitoring requirements are addressed in the response to Comments 2-5. Issues expressed regarding analysis of zero percent capture are addressed in the response to Comment 4-6 and in Section 4.16 of the EIS.

Comment 8-14: *the DEIS reports that demand for the CO_2 at the sequestration site is expected to last for the life of the facility, 30 years, DEIS at 2-36, but then states that sequestration might last only for the duration of the demand for CO_2 to be used in EOR in the region. Id. The DEIS does not evaluate the climate implications if demand for CO_2 does dry up, either at the West Hastings Oil Field or elsewhere in the region. Id. Without a market for the compressed CO_2, Leucadia would have to vent its captured CO_2 stream. The consequence would be the addition of a major new source of CO_2 emissions— one of the largest in the state of Louisiana (DEIS at 5-19)—operating for another several decades with no mitigating capture and sequestration. Despite all of the uncertainties related to the actual capture and sequestration of CO_2 in this project, the DEIS does not contemplate the potential climate impacts if the project fails to sequester 89% of the CO_2 produced. The DEIS must analyze the climate impacts if the facility is capturing less than 89% of its estimated CO_2 production, including the impact of no carbon capture at all.*

Response: Issues expressed regarding analysis of zero percent capture are addressed in the response to Comment 4-6 and in Section 4.16 of the EIS.

Comment 8-15: *DOE asserts that the Lake Charles CCS project "would capture and geologically store approximately 4.6 million metric tons per year of CO_2 that would otherwise be emitted to the atmosphere." DEIS at S-37. Based on other statements in the DEIS, however, this statement is misleading or at least unsubstantiated. The DEIS notes that only approximately 1 million tons would be monitored at the West Hastings oil field. DEIS at S-4, 1-3.9 Thus, it appears that there are no plans to monitor 3.6 million tons of CO_2, or 78% of the CO_2 that the project plans to capture. It is not even clear where, or if at all, this remaining CO_2 would be sequestered. The absence of plans to sequester, or monitor the sequestration of 3.6 million tons of CO_2 should be made explicit in the DEIS. DOE's references to 89 % capture of CO_2 are misleading absent reassurances about how this significant amount of CO_2 will be handled. Finally, the DEIS must evaluate the climate impacts of the 3.6 million tons that are not sequestered or monitored, rather than assuming 89% capture in its analysis. See DEIS at 5-9.*

Response: The Funding Opportunity Announcement (FOA) does not require monitoring of all the CO_2 captured by the proposed project in the research MVA program. The CO_2 from the proposed project will transported to Denbury's Green Pipeline, where it will combine with other sources of CO_2 and transported for use in EOR in a variety of oil fields in the Gulf Coast region. The purpose of the West Hastings research MVA program is to track a substantial amount of CO_2 (1 MM tons per year or more) in a representative oil field, providing a high level of confidence that the CO_2 will remain permanently sequestered through EOR operations in an oil field of this type.

All of the CO_2 used in the commercial EOR process would be monitored in accordance with the conditions of the UIC permit using Denbury's normal commercial monitoring activities, as described in 2.3.2.3. Of the CO_2 used at Hastings oil field, 1 million tons would be subjected to the additional research MVA program and would employ several additional techniques to observe the movement of CO_2 in the subsurface formations.

As for the fate of the total of the CO_2 captured by the plant, note that the plant is designed for approximately 89% capture, and that Denbury is contractually obligated to purchase the captured

CO_2 from Leucadia in accordance with the terms of the terms of the independent, commercial agreement between Denbury and Leucadia. The economics of the plant and the CO_2 off-take agreement (both reviewed by DOE) indicate that Leucadia has a strong economic incentive to sell the CO_2 to Denbury rather than vent it (see response to comment 4-6). As high purity CO_2 is a valuable commodity and Denbury has extensive EOR interests in the Gulf Coast region, DOE does not consider it a realistic possibility that Leucadia would intentionally vent a substantial portion of this CO_2. Therefore, it is reasonable to assume that the CO_2 captured, but not subject to the research MVA program, will be used in commercial EOR operations and be sequestered in commercial EOR operations in a similar fashion to the CO_2 that is being monitored in the research MVA program.

Comment 8-16: *Climate change is affecting the intensity of Atlantic hurricanes, and hurricane damage will likely continue to increase because of climate change. DEIS has failed to fairly examine the effect it will have on climate change. Immediately after DOE explains that climate change is a cumulative event and that the reduction of greenhouse gases (GHGs) will be necessary to mitigate the harms of climate change, the DOE concludes that the "emissions of GHGs from the LCCE Gasification Plant by themselves would not have a direct impact on the environment in the proposed plant's vicinity; neither would these emissions by themselves cause appreciable global warming that would lead to climate changes." DEIS at 5-21 to 5-22. These conclusory statements fall desperately short of sufficient NEPA analysis. See 40 C.F.R. § 1508.7 (an agency must assess the "impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions"); .....it must provide 'a useful analysis of the cumulative impacts of past, present, and future projects'")(citations omitted). DOE also states there is "no methodology that would allow DOE to estimate the specific impacts (if any) this increment of warming would produce in the vicinity of the plant or elsewhere." DEIS at 5-22. This statement too, falls short of the requirements under NEPA. The inability to estimate the specific impacts is not an excuse for failing "to estimate what those effects might be before irrevocably committing to the activity." Conner v. Burford, 848 F.2d 1441, 1450 (9th Cir. 1988). Inherent uncertainties regarding climate change do not allow DOE to "shirk [its] responsibilities under NEPA." Kern v. U.S. Bureau of Land Mgmt., 284 F.3d 1062, 1072 (9th Cir. 2002) (quoting Save Our Ecosystems v. Clark, 747 F.2d 1240, 1246 n.9 (9th Cir. 1984)); cf. Natural Res. Def. Council v. Kempthorne, 506 F. Supp. 2d 322, 369 (E.D. Cal. 2007) (rejecting agency position characterizing global warming's effects to endangered fish as speculation or "sheer guesswork").*

NEPA Section 102(F) requires that the federal government "recognize the worldwide and long-range character of environmental problems." 42 U.S.C. § 4332(F). This includes global climate change. DOE states that stabilizing atmospheric concentrations of GHGs will require societies to reduce their annual emissions (DEIS at 5-22) – and the construction of facilities that will produce or recover high-carbon fuels like methanol and oil will not accomplish this task.

Response: DOE acknowledges that the contribution of any single facility to the worldwide atmospheric concentration of CO_2 would be negligible and that the incremental impacts on global climate change cannot be determined effectively. Therefore, DOE considered the impacts of CO_2 emissions on global climate to be a subject for cumulative impact analysis. DOE addressed climate change in Section 5.2.2, and adhered to the standards set forth by the CEQ, including the *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas*

Emissions. Specifically, CEQ acknowledges that "Research on Climate Change is an emerging and rapidly evolving area of science. In accordance with NEPA's rule of reason and standards for obtaining information regarding reasonably foreseeable significant adverse effects on the human environment, action agencies need not undertake exorbitant research or analysis of projected climate change impacts in the project area or on the project itself, but may instead summarize and incorporate by reference the relevant scientific literature" (CEQ 2010).

DOE completed a Green House Gas life-cycle analysis (GHG LCA) for the proposed project and its connected action to assess emissions of GHG which is described in response to Comment 4-8 and presented in Section 4.2.5 of the final EIS. The GHG LCA shows that the production of methanol, hydrogen, sulfuric acid, and captured CO_2 at the LCCE Gasification plant and Lake Charles CCS project results in GHG emissions that are 52 percent less than the conventional routes of production for the same amounts of methanol, sulfuric acid, and hydrogen produced. This "business-as-usual" case assumed that the petroleum coke is shipped overseas to be combusted where emissions regulations are not as stringent as the U.S. instead of being used as a feedstock at the LCCE Gasification plant. Overall, there is a net benefit in GHG emissions associated with the operation of the LCCE Gasification plant compared to conventional operations.

DOE's conclusion that emissions of GHGs from the LCCE Gasification plant by themselves would not have a direct impact on the environment in the proposed plant's vicinity and that these emissions by themselves would not cause appreciable global warming that would lead to climate changes is based on two primary factors. First, the variability in the effects of climate change does not support a conclusion that CO_2 emissions from LCCE Gasification would cause or have a measurable impact to climate change in the region. As noted in Section 5.2.2, the IPCC analyses demonstrate that on a regional scale, there is greater natural variability in climate parameters, which makes it difficult to attribute particular environmental impacts to climate change. The IPCC also found that "confidence in projecting changes in the direction and magnitude of climate extremes depends on many factors, including the type of extreme, the region and season, the amount and quality of observational data, the level of understanding of the underlying processes, and the reliability of their simulation in models (IPCC 2012). Our collective understanding of climate and our modeling capabilities do not allow prediction of the impact of one project or even several projects on climate change. Second, the annual emissions of 0.64 million tons and the total lifetime CO_2e emissions from LCCE Gasification of 19 million tons were compared to the annual emissions of the US industrial sector or 857.4 million tons, as described in Section 5.2.2.1 . LCCE Gasification would, therefore, account for 0.075% of the U.S. industrial sector emissions annually. The emissions from LCCE Gasification are not trivial, but the comparison provides perspective on the potential for measureable impact. This comparison is relevant to "the impact on the environment which results from the *incremental* impact of the action" (US Court of Appeals 2001).

DOE agrees with the scientific community that the cumulative effects of CO_2 emissions on global climate change cannot be ignored, which is why the agency is proposing this action (See 1.3 Purpose and Need for DOE Action) and continues to fund research and projects involving carbon capture and storage.

References:
Council on Environmental Quality (CEQ). 2010. Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions. Memorandum to Heads of Federal Departments and Agencies from Nancy H. Sutley, Chair, Council on Environmental Quality. Available at: http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf. Accessed on October 3, 2013.

Intergovernmental Panel on Climate Change (IPCC). 2012. Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. Special Report of Working Groups I and II. Available at: http://ipcc-wg2.gov/SREX/images/uploads/SREX-All_FINAL.pdf. Accessed on October 3, 2013.

United States Court of Appeals for the 9th Circuit (US Court of Appeals). 2001. Churchill County v. Norton, 276 F.3d 1060, 1072 (9th Cir.2001). Available at: https://law.resource.org/pub/us/case/reporter/F3/276/276.F3d.1060.00-15967.html. Accessed on October 3, 2013.

Comment 8-17: *The DOE also failed to assess the impacts of global warming pollution on different environmental receptors such as wildlife, vegetation, water resources, humans, and land. DOE should pay particular attention to the impact of global warming on Louisiana, a coastal state that is especially vulnerable to rising sea levels and more intense tropical storms.*

Response: Issues expressed in this comment are addressed in the response to Comment 8-16.

Comment 8-18: *The DEIS arbitrarily analyzes a one-mile radius around the facility for environmental justice effects. DEIS at 3-78. The decision to analyze only a one-mile radius around the facility frames out of the analysis the paradigmatic environmental justice community of Mossville, just two miles from the LCCE Gasification Plant site. Mossville was founded by African Americans in the 1790s. Today its population is largely African American and low-income individuals, and it residents have been fighting for environmental justice for years. The DEIS's failure to even mention Mossville, which is just two miles away from the proposed facility, is extremely misleading. From reading the DEIS, the public would not be made aware that DOE is proposing to make possible the development of a major new industrial facility so close to a community already burdened by pollution. The Memorandum of Understanding on Environmental Justice and Executive Order 12898, which was recently affirmed by President Obama, requires DOE to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Exec. Order No. 12898, 59 Fed. Reg. 7629 (Feb. 11, 1994). The fact that the DEIS fails to even recognize that a minority and low-income population that has been ravaged by adverse health affects from industrial plants exists in the area, shows the extent to which DOE has violated the requirement under this order. In order to fulfill the Executive Order requirements, the DEIS must thoroughly discuss the Mossville community, taking into account the petrochemical and industrial plants already operating in the area and their emissions, the health and environmental harms the Lake Charles area already suffers from because of the existing petrochemical and industrial facilities in the area, and the harms they could suffer in the future from the cumulative effects of the existing facilities and the LCCE Gasification Plant together.*

Response: Analysis of Environmental Justice areas relies on census data to determine whether a population has higher percentages of minority, low-income, or Native American populations than the surrounding city, county, and state. Mossville is unincorporated, and census data is not available under that name; however, the environmental justice analysis in Section 4.9.2.2 of the DEIS already includes Mossville in the analysis because Mossville is part of Census Tract 27 for the CO_2 pipeline. The southern border of Mossville is 3.4 miles from the LCCE facility, but the proposed CO_2 pipeline route crosses through Mossville.

A NEPA environmental justice analysis must consider all census blocks equally when determining whether proposed action related impacts have "disproportionately high and adverse human health or environmental effects …. on minority populations and low-income populations." As discussed in Section 3.9.2, the study area for the environmental justice analysis was 1 mile for the LCCE Gasification plant because most impacts would occur within this area. In fact, the majority of minor impacts would occur in the immediate vicinity of the proposed project. The census blocks within one mile of the study area of the LCCE Gasification plant did not qualify as environmental justice areas because the census block groups within the study area exhibit lower percentages of population living below the poverty level, minority population, or Hispanic population than in the city of Sulphur, the parish, or the state. However, 14 census block groups in the vicinity of the proposed CO_2 pipeline route have the potential to represent an environmental justice area. As discussed above, Mossville is in Census Tract 27 and is one of the 14 census blocks in the group that is in the vicinity of the CO_2 pipeline.

As a result of this comment, DOE systematically documented the evaluation of each resource area to determine whether there were any disproportionately high and adverse human health or environmental effects to residents of Mossville or any of the other 13 census block groups from construction and operation of the LCCE Gasification plant, the plant water supply and hydrogen pipelines, and the proposed CO_2 pipeline. None were found, as was previously stated in Section 4.9.3.2.1. The documentation of the evaluation is provided in Appendix I of the final EIS. Below is a summary of this review.

LCCE Gasification Plant

As described in Section 4.2.2 of the DEIS, the air dispersion modeling performed for the construction and operation of the LCCE facility, indicated that the maximum concentrations for all criteria pollutants would not exceed the national ambient air quality standards (NAAQS) or the LDEQ ambient air standards (AAS) at any location. The LDEQ reviewed and approved the air modeling protocol. Similarly, the modeling results for state regulated air toxics, such as carbonyl sulfide, hydrogen sulfide, and sulfuric acid, indicated that all concentrations at all locations were significantly below the LDEQ AAS. For example, for carbonyl sulfide, which has an AAS of 582 $\mu g/m^3$, the highest concentration of 1.2 $\mu g/m^3$ was at the plant site and values at 1 mile would range from 0.03 $\mu g/m^3$ to 0.06 $\mu g/m^3$. Concentrations within Census Tract 27 and Mossville, which are located approximately 3.4 miles from the site, would be 0.03 $\mu g/m^3$ or less. Modeling of cumulative sources for hydrogen sulfide also resulted in concentrations below the LDEQ AAS at all locations.

Minor impacts on other resource areas would either be localized within the boundary of the plant (geology, surface water, biology, cultural resources, land use) or would affect the surrounding populations in an equal manner (socioeconomics, traffic and transportation, noise, materials,

human health and safety). Therefore, there would be no disproportionately high and adverse human health or environmental effects to Mossville or Census Tract 27 residents from construction and operation of the LCCE gasification plant.

LCCE Gasification Plant Water Supply and Hydrogen Pipelines
The LCCE Gasification plant water supply pipeline and hydrogen pipeline corridors do not extend to Mossville or Census Tract 27. The proposed water supply line will run from the LCCE plant site to within approximately 0.3 miles of the nearest Mossville boundary. The proposed hydrogen pipeline would extend from the LCCE plant to within approximately 2 miles of the Mossville boundary. Minor impacts associated with construction and operation of these pipelines would primarily affect residents along the pipeline routes. Therefore, there would be no disproportionately high and adverse human health or environmental effects to Mossville or Census Tract 27 residents from construction and operation of the water supply and hydrogen pipelines.

Proposed CO_2 Pipeline
The proposed CO_2 pipeline is approximately 11.9 miles long. The total length of the pipeline within Mossville is approximately 0.3 miles (2.7%), and the total length within Census Tract 27 is approximately 3.7 miles (34%). Construction of the pipeline would have temporary and negligible effects on air quality over its entire length and operation of the pipeline could result in small amounts of fugitive CO_2 emissions at any point along the pipeline route. Therefore, air quality in Mossville and Census Tract 27 would not be disproportionately impacted. There would be minor temporary impacts on prime farmland during pipeline construction, but only 2.8 % of the 107 acres of prime farmland are in Mossville and 38% are in Census Tract 27, so these areas would not be disproportionately affected. Minor impacts on other resource areas (surface water, biology) would occur in various areas over the entire length of the pipeline route, or would affect the surrounding populations in an equal manner (socioeconomics, traffic and transportation, noise, materials). Therefore, there would be no disproportionately high and adverse human health or environmental effects on the Mossville and Census Tract 27 population from construction and operation of the CO_2 pipeline.

Comment 8-19: *Many Mossville residents believe their health and the health of their neighbors have been severely harmed from the toxic emissions from the facilities surrounding their home. Indeed, there is much evidence tending to show the harm of these facilities on Mossville's residents. For example, cancer mortality rates for black males are higher in Calcasieu Parish than in any other parish in the State, and a small sample of 28 Mossville residents showed their blood to have an average of three times the amount of the toxic chemical dioxin than the comparison group. Mossville is surrounded by 14 chemical plants, including Conoco Phillips, an oil refinery and Georgia Gulf, a vinyl chloride factory. Only one of these fourteen plants, Sasol, is so much as mentioned in the DEIS. DEIS at 5-6. The DEIS mentions other industrial plants in the area including a Citgo Refinery, the City of Sulphur's wastewater treatment plant, and Halliburton Energy Services, but without any discussion of the cumulative impact of another major industrial complex to this community already burdened by pollution and the risk of catastrophic industrial accidents. See DEIS at 2-2. In fact, facilities in this area are already releasing huge amounts of several chemicals that will be stored on the LCCE Gasification Plant site, including ammonia, methanol, and chlorine.*

Response: Analysis of potential environmental justice areas relies on census data to determine whether a population has higher percentages of minority, low-income, or Native American populations than the surrounding city, county, and state. Mossville is unincorporated, and census data is not available under that name; however, the environmental justice analysis in Section 4.9 of the DEIS already includes Mossville in the analysis. Mossville is part of Census Tract 27 for the CO_2 pipeline. Section 3.9.2 of final EIS has been updated to include a discussion of Mossville.

As summarized in the response to Comment 8-18, DOE systematically documented the evaluation of each resource area which is provided in Appendix I of the final EIS. No disproportionately high and adverse human health or environmental effects to residents of Mossville or any of the other 13 census block groups from construction and operation were found, as was previously stated in Section 4.9.3.2.1.

The baseline air and water quality conditions described in Sections 3.2.2 and 3.4.2 reflect the current emissions and discharges of the industrial plants that are mentioned in the comment. As discussed in Section 5.2.1, it was determined that the proposed action would not contribute cumulative air quality impacts for criteria pollutants. The analysis conducted considered both existing conditions and reasonably foreseeable projects.

As discussed in Section 4.2.2.1.1, the Applicant would implement a Stormwater Pollution Prevention Plan during construction of the Gasification Plant and other off-site facilities to ensure that discharges would not exceed total maximum daily load levels at the Gasification Plant location. A SWPPP would also be implemented at the offsite location and during the construction of the CO_2 pipeline. As discussed in Section 4.4.2.2.1, during operations of the Gasification Plant, wastewater would be discharged based on the wastewater discharge limits specified in the LDEQ LPDES Water Discharge Permit LA0124541 and AI No. 160213 (see Table 4.4-5). LDEQ establishes permit limits based on what the receiving water can accept while maintaining water quality standards. By issuing the LPDES Water Discharge Permit, LDEQ has considered the existing discharges in the receiving water and the potential discharges generated by the Applicant in its determination. Mossville is located upstream of the proposed Gasification Plant; therefore, it would not be affected by any regulated discharges from the Plant. The CO_2 pipeline would traverse Mossville. Under normal operating conditions, there would be no discharges from the CO_2 pipeline. Therefore, the project and the connected action would not contribute to any cumulative impacts to water quality in Mossville.

The southern border of Mossville is 3.4 miles from LCCE Gasification plant. Of the 32 accident release scenarios evaluated in Section 4.15 and Appendix F for the distances at which Acute Exposure Guideline Levels may occur, only three reach Mossville or Census Tract 27. Exposure risks to the residents of Mossville are significantly less than for residents who live closer to the proposed project and connected action. Denbury conducted a risk analysis for the CO_2 pipeline that would traverse Census Tract 27 and has committed to implementing specific risk mitigation measures in their pipeline design and operations for those parts of the pipeline that are near:

(1) A commercially navigable waterway, which means a waterway where a substantial likelihood of commercial navigation exists;

(2) A high population area, which means an urbanized area, as defined and delineated by the Census Bureau, that contains 50,000 or more people and has a population density of at least 1,000 people per square mile;
(3) Other populated area, which means a place, as defined and delineated by the Census Bureau, that contains a concentrated population, such as an incorporated or unincorporated city, town, village, or other designated residential or commercial area;
(4) An unusually sensitive area as defined by the Pipeline Integrity Management in High Consequence Areas requirements (49 CFR 195.452).

These mitigation measures were also described in Appendix G.

Comment 8-20: *The LCCE Gasification plant will involve the storage of 3.3 million gallons of sulfuric acid and 9.6 million gallons of methanol onsite, along with many other chemicals. Another 3.8 million gallons of sulfuric acid and 3.0 million gallons of methanol will be stored off-site on a parcel of land that has not yet been identified. DEIS at S-8. That parcel of land could be even closer to residences, schools, and parks.*

Response: Issues expressed in this comment with respect to the location of the methanol and sulfuric acid storage area are addressed in the response to Comment Response 2-6. The EIS was updated to reflect new information regarding the proposed offsite location and its proximity to sensitive receptors.

Comment 8-21: *All of these chemicals will be stored in an area that is extremely vulnerable to hurricanes, and indeed has previously been destroyed by hurricanes. DEIS at 3-53. Despite recognizing the potential for natural disasters in the Gulf Coast region, the DEIS fails to discuss the implications these disasters could have on the surrounding community if the extremely hazardous materials stored on the proposed site were to be released.*

Response: Leucadia would design the proposed project and connected action in accordance with all local, state and national design codes, some of which account for the potential for natural disasters in that specific area. Specifically, the design standards for the equipment, buildings and support structures would reflect the local wind conditions (see updated text in Section 2.3.1.1). Section 3.2.1 describes the potential for severe weather in the Lake Charles area. For wind, Leucadia would follow American Society of Civil Engineers (ASCE) 7-05 Minimum Design Loads for Building and Other Structures which specifies a design wind velocity of 110 mph with importance factor 1.15.

The accident scenarios in Appendix F and Section 4.15 did not differentiate between the origins of the accident. It could be either natural or man-made; therefore, accidents that could occur as a result of natural disaster have been analyzed.

8-22: *As it did at the LCCE Gasification Plant site, the DEIS arbitrarily confines the scope of its environmental justice analysis to a one-mile radius around the West Hastings Oil Field. DEIS at 3-82. However, unlike the Lake Charles area, DOE does find that there is an environmental justice area in that one-mile radius. DEIS at 3-83. In fact, nearly half of the population in the one-mile radius around the proposed MVA research site is Hispanic. DEIS at 3-82. All census tracts included in the DOE's study had higher poverty rates and/or minority rates than the rest of the cities, county and state in which they were located: Alvin, Texas, and Pearland, Texas in*

Brazoria County. DEIS at 3-83. Although the DEIS acknowledges this, it fails to analyze any potential environmental justice impacts of the EOR, because it considers impacts from the MVA research project—not the underlying EOR operations. The DEIS determines that any impacts from monitoring activity would be minor, and therefore finds that there would be no disproportionate impacts on minority or low-income residents. DEIS at 4-90 to 4-91. As explained above, by increasing the supply of and infrastructure for CO_2 suitable for EOR, this project is increasing the likelihood that EOR operations will continue or expand at West Hastings and other oil fields in the region. Therefore, the environmental effects of EOR activity must be considered in connection with this project.

Response: As discussed in Section 3.9.2.3 and 4.9.2.3, the EIS concluded that the West Hastings research MVA area is a potential environmental justice area because of a higher percentage of minority, Hispanic, and/or low income residents. However, no substantial, unmitigated, negative human health or environmental impacts resulting from the research MVA activities occur; therefore, there would be no disproportionate impacts on minority, Hispanic, and/or low-income residents.

The EOR operations are not part of the proposed project. Instead, they are part of existing operations, and will continue unchanged regardless of DOE's funding decision; therefore, the commercial EOR operations are not included in the environmental justice analysis.

Comment 8-23: *Recovering oil has known negative effects on the air quality, including the emission of ozone forming VOCs. These operations are taking place in the Houston-Galveston air quality region, one of the worst non-attainment regions in the country for ozone. The DEIS must fully analyze the impact these EOR activities will have on the surrounding air quality and the harm to Alvin and Pearland communities, who have already suffered their fair share of ozone pollution from the West Hastings Oil Field and other industrial activities.*

Response: As described in Section 1.5, the scope of this EIS does not include current commercial operations, specifically the existing EOR operations at the West Hastings oil field. Denbury's existing commercial EOR operations and associated commercial monitoring activities are independent of the proposed project and would occur regardless of the proposed project and DOE's decision on the proposed action.

Comment 8-24: *The DEIS concludes without further discussion that because the large volume of water the plant will use is currently available and because the Sabine Diversion Canal's purpose is to supply water for industrial consumers, construction of the plant would have no or negligible effect on water availability or local water use. DEIS at 4-34. Simply citing the large storage volume of Toledo Bend Reservoir provides no reassurance that this major new demand will not strain local water supplies, since the DEIS presents no information concerning other demands on the water in Toledo Bend. In Table S-4 (DEIS at S-38), DOE acknowledges other likely future industrial projects for the Lake Charles area, but does not evaluate the water demands imposed by these facilities in conjunction with the LCCE Gasification Plant.*

Response: As indicated in Section 3.4.1, water would be obtained from the Sabine River Diversion (SRD) System, which is operated by the Sabine River Authority in Louisiana. The SRD System was created in 1970 to use impounded waters from the Toledo Bend Reservoir to deliver fresh raw water from the Sabine River to industries located in the Lake Charles industrial

area, for municipal water use, and for farm irrigation along the diversion route. As noted in Section 3.4.1, the SRD System pumped almost 20 billion gallons of water each year, primarily for industrial use (SRA 2011). The LCCE Gasification plant would require approximately 4.4 billion gallons of water annually. According to the SRA Louisiana, the combined usage of the existing contracts represents 30% of the existing capacity of the system and it is within the SRA's capacity to assume the water demand of the proposed project (Rumsey 2013 and Carr 2013). Assuming that 20 billion gallons of water represents 30 % capacity, then the addition of the proposed project would represent 30.2 % of the capacity of the Sabine River Diversion (SRD) System. Therefore, the LCCE Gasification plant's withdrawal would be expected to have negligible impact on water availability and local water use. Section 4.4.2.2.1 has been updated with this additional information.

The cumulative impacts analysis in Section 5 does not evaluate the water demands imposed by these facilities in conjunction with the LCCE Gasification plant because its impacts would be negligible. As described in Section 5.1.4, if a potential impact evaluated in Chapter 4 was determined to be negligible, no further evaluation of potential cumulative impacts was conducted. In these cases, the addition of the proposed project and connected action could result only in a negligible additional adverse impact in the worst case.

References:
Rumsey, B. Sabine River Authority 2013. Telephone conversation with Louise Flynn, Ecology and Environment, Inc. about the capacity of the SRA to take on new customers. August 19, 2013.

Carr, M, B. Sabine River Authority 2013. Email from M. Carr to Louise Flynn, Ecology and Environment, Inc. about the capacity of the SRA to take on new customers. October 22, 2013.

Comment 8-25: *Nor did the DEIS analyze the potential for drought and the impact the project's water usage could have on water availability in the region. The 2010 Sabine River Authority Hazard Mitigation Plan states that in each of the last 10 years almost 15 weeks of drought occurred and assesses the risk for future drought as high. Between 1997 and 2008 20 drought impacts to agriculture were reported. These impacts included devastating losses of crops and in some cases livestock, and the economic losses have been substantial. In east Texas, customers of the Sabine River Water Authority had water restrictions from droughts in 2011. The 12.2 million gallons of water that Leucadia plans to use each day from the Sabine River is a substantial amount of water from a river that just two years ago was not able to meet demand. Despite recognizing that climate change will increase the potential for drought (DEIS at 5-20), the DEIS fails to even consider the possibility of drought in its assessment of water availability. The DEIS must analyze the potential impact on water availability the LCCE Gasification Plant will have when drought returns to the Sabine again.*

Response: The source of water from the SRA is the Toledo Bend Reservoir which has a storage capacity of 4,477,000 acre-feet of water, as described in Section 4.4.2.2.1. Toledo Bend Reservoir is jointly-owned by the states of Louisiana and Texas. The reservoir's annual surplus water supply, or water that may be sold, is divided between Texas and Louisiana.

Most of the Sabine River Basin was classified as being in an exceptional drought, the worst classification, during most of 2011. Power generation from the Toledo Bend Hydroelectric

Project was limited and 700 cfs was released from the dam to meet downstream water quality and delivery requirements (Carr 2013). In general, during drought conditions, flows downstream of Toledo Bend are governed by existing requirements based on the reservoir level of Toledo Bend reservoir or downstream flow conditions.

Under drought and non-drought conditions, the SRA has a federal mandate to maintain a specific flow of water to downstream users which include both industrial and agricultural users. Both the SRA of Texas and Louisiana have drought plans. When considering purchase agreements, the SRA Louisiana assesses current demand, future demand projections, and hazards, including drought. The project's water demands were reviewed by SRA and approved through a purchase agreement between Leucadia and SRA Louisiana. Section 4.4.2.2.1 has been updated with this additional information.

References:
Carr, M, B. Sabine River Authority 2013. Email from M. Carr to Louise Flynn, Ecology and Environment, Inc. about the capacity of the SRA to take on new customers. October 22, 2013.

Comment 8-26: *The DEIS fails to adequately analyze whether construction of the LCCE Gasification Plant and offsite storage area will impact floodplain drainage and therefore increase the chance of flooding in the area. DEIS at 4-26. Floodplain drainage is particularly critical because of the Lake Charles area's high vulnerability to flooding. The DEIS skirts this topic because the Calcasieu Parish Police Jury Division of Engineering and Public Works issued a waiver for the drainage assessment. DEIS at 4-26. The DEIS does not state the basis for this waiver being issued—yet concludes that "construction of the site . . . would not increase the potential for floods." Id. Waivers of this nature can be granted for any number of reasons, and it is not apparent that this waiver was granted because the development of this 70-acre riverfront site requiring fill of over 26 acres of wetlands and elevation of the project site above the floodplain will have no flooding impact whatsoever. The DEIS must either indicate that a determination was made as part of the waiver process that there would be no impact, or it must assess the flood impact the facility will have.*

Response: DOE discussed the potential impacts to floodplains in the Wetland and Floodplain Assessment, Appendix E.

Floodplain impact assessments in Calcasieu Parish are made either by the Parish's local floodplain administrator or the Calcasieu Parish Police Jury Division of Engineering. DOE coordinated with both of these entities to determine that floodplain impacts were evaluated through the Parish's Division of Engineering which issued a waiver based on engineering information. A January 24, 2012 letter from Levingston Engineers, Inc. conveyed drainage maps of existing and proposed conditions as a result of the Lake Charles Cogeneration project. Drainage features were planned and sized to accommodate changes as a result of the project. Based on their drainage study, Levingston Engineers, Inc. concluded that "current proposed systems (presume east and west drainage systems of widened and deepened ditches and culverts) were sized to accommodate the entire runoff from the 71 acre proposed Lake Charles Cogeneration facility." Levingston further stated that the "installation should provide no impact on upstream developments and only minor impacts on upstream water surface elevations." The Calcasieu Parish Police Jury Division of Engineering concurred through its issuance of the waiver.

The U.S. Army Corps of Engineers and Federal Emergency Management Agency received copies of the DEIS and provided no comment on floodplain impacts. DOE defers to the judgment of agencies with primary responsibility of floodplain management regarding the issuance of permits and waivers and any requirements for the site owner.

Section 4.4.2.2.1 has been updated with this additional information.

Comment 8-27: *The DEIS recognizes that the LCCE Gasification Plant alone would impact 26.2 acres of forested and emergent marsh wetlands. DEIS App. E, at 8. The DEIS seeks to reassure the public that mitigation was required in connection with the Section 404 permit for that wetland fill, but provides no information about that mitigation, other than stating that it took place "through an agreement" of involved parties.*

Response: Throughout the document, the EIS identifies and analyzes the impacts of the site preparation activities that have already occurred, specifically, the filling of 26.2 acres of wetlands on the LCCE Gasification site. This EIS includes these impacts in the analysis of the connected action in order to catalog the full range of impacts to a site only recently disturbed. With respect to the LCCE Gasification site, Section 1.5 explains that USACE conducted a jurisdictional wetland determination as part of its permit approval for site development. Based on the wetland delineation and USACE jurisdictional determination, the Port of Lake Charles received a permit, issued on August 18, 2008, to construct a facility on the 70-acre LCCE Gasification plant site. Site preparation activities for the LCCE Gasification plant, including clearing and grading, began in January 2010.

The USACE New Orleans District, Regulatory Branch has jurisdiction over the project in Louisiana and provides standard operating procedures to determine the need, appropriateness and quantity of compensatory mitigation and assures that the required mitigation is consistent with the legal requirements. The impact to wetlands was offset through the purchase of compensatory credits in a wetland mitigation bank. The credits were purchased from Stream Wetland Services, LLC mitigation bank (see Section 4.4.2.1.1).

Comment 8-28: *Wetlands provide critical protection from flood waters and are a huge asset to Louisiana's recreational and agricultural interests as well as the interests of the seafood industry. The Louisiana wetlands are extremely fragile and face huge losses every year. For this reason, mitigation must be very carefully designed and implemented where any wetland destruction is permitted. There are real environmental, economic, and cultural impacts if wetland mitigation is done incorrectly. The DEIS provides none of the basic facts that would establish a proper mitigation plan. It is critical that the public be informed where the mitigation took place, whether the mitigation wetlands will be properly monitored, and whether the mitigation wetlands are of the same kind as the wetlands that were lost, and therefore will provide the same habitat and ecosystem services.*

Response:
The USACE New Orleans District, Regulatory Branch has jurisdiction over the project in Louisiana and provides standard operating procedures to determine the need, appropriateness and quantity of compensatory mitigation and assures that the required mitigation is consistent with the legal requirements. Fundamental objectives of compensatory mitigation are to offset

permitted unavoidable impacts authorized under a Department of Army permit. One type of compensatory mitigation is the buying of credits in mitigation banks.

Denbury applied for a USACE permit for the CO_2 pipeline. The preferred CO_2 pipeline route would impact 10.79 acres of wetlands (see Section 4.4.3.2.1 and Table 4.4-10). As discussed in Section 4.4.3.2.1, mitigation would include on-site restoration of wetlands temporarily impacted through construction and the purchase of mitigation credits from approved wetland banks in the affected watershed.

Offsite activities associated with LCCE Gasification may also require USACE permits. All required surveys, including cultural and species, would be performed as part of the permitting process before any construction begins at those locations.

Comment 8-29: *It does not appear that DOE has yet received the concurrence of the FWS in its assessment that the project will have no impact on protected species.*

Response: DOE notified USFWS Louisiana Ecological Services on September 28, 2012, of the proposed undertaking and to request technical assistance. The request provided maps and a description of the area of interest in Calcasieu Parish, Louisiana including:

- the CO_2 capture and compression facilities for the Lake Charles CCS Project on the west bank of the Calcasieu River;
- the LCCE Gasification project, located entirely within the AGR and compression facilities site also on the west bank of the Calcasieu River;
- the offsite facilities associated with the LCCE Gasification project including the proposed new methanol storage area; hydrogen pipeline; water supply pipeline; natural gas pipeline; co-located transmission line, potable water line, and methanol pipeline; equipment laydown area; and offsite parking area (see Enclosure 2).
- the proposed new 11.1-mile long CO_2 pipeline transporting CO_2 to the existing Green Pipeline; or,
- the alternative 11.6-mile long alignment for the CO_2 pipeline that connects to the existing Green Pipeline to the southwest.

The Request also noted that project area in Texas includes the location of the proposed CO_2 sequestration in an ongoing commercial enhanced oil recovery operation at the existing Hastings Oil Field in Brazoria County, Texas and that the proposed Research MVA program at the existing Hastings Oil Field will not result in any new project-related facilities.

On March 26, 2013, USFWS concurred that the proposed project would not likely to affect resources under the jurisdiction of Endangered Species Act. The USFWS stamp and signature appear on the last page of Appendix C.

Activities in Texas would include monitoring within the existing Hastings Oil Field. Denbury would not drill any new wells or construct any new facilities for the West Hastings research MVA program. Denbury and BEG would conduct the West Hastings research MVA activities using existing wells for monitoring wells and access these wells from existing roads. However, if during any phase of the proposed project, it is determined that a federally listed species might

be adversely impacted, DOE will initiate further consultation with USFWS in accordance with the requirements of the ESA (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Comment 8-30: *The DEIS's evaluation of impacts to wildlife also rests on the determination of the state Department of Wildlife and Fisheries that there would be no impacts to rare or threatened species, however, its analysis was purely based on a database compiled by the Louisiana Natural Heritage Program. A compilation of data on species is hardly enough to insure that any action the DOE takes here is not likely to jeopardize the continued existence of any endangered or threatened species. Indeed, the letter includes a disclaimer that states, "[i]n most cases, this information is not the result of comprehensive or site-specific field surveys . . . nor should they be substituted for on-site surveys required for environmental assessment." DEIS App. C. Unfortunately, it seems that DOE ignored this disclaimer and proceeded to rely on the cursory assessment done by the state FWS.*

Response: DOE asserts that the appropriate level of analysis was conducted for the EIS. The steps in the analysis included:

- Consultation with USFWS and LDWF through coordination letters (see Appendix C of the FEIS).
- Review and analysis of
    - USFWS and TPWD protected species lists
    - Information provided by the Louisiana Statewide Red-cockaded Woodpecker (Picoides borealis) Safe Harbor Program
    - The Texas Parks and Wildlife Department's rare, threatened, or endangered species list for Brazoria County, Texas
    - Field surveys conducted by the Applicant
    - Desktop surveys
    - Aerial imagery

These data were used to determine the presence or likely presence of protected species and natural communities. As part of the federal and state permitting process, site-specific surveys would be required for the hydrogen pipeline, water supply pipeline, and the equipment laydown/methanol and sulfuric acid storage area. LDWF also provided direction regarding the CO_2 pipeline in their March 25, 2011 letter, which has been added to Appendix C. The LDWF requirements regarding preconstruction surveys for nesting colonies of water birds includes:

- Undertake a field visit by qualified biologist no more than two weeks before project activities begin in the field to document if colonial water birds are present and the extent of any colonies;
- Provide a survey report to LDWF that includes qualifications of survey personnel; survey methodology; birds species present with their activities, estimated number of nests, and general vegetation type; and digital photographs, topographic maps, and ArcView shapefiles to illustrate the location and extent of any colony found; and
- Undertake further consultation with LDWF if active nesting colony is found within 400 meters (700 meters for brown pelicans) of project site.

Comment 8-31: *According to the USFWS, some of these protected species include the red cockaded woodpecker, the bald eagle, the Louisiana Black Bear (DEIS at 3-48), and the old*

Prairie crawfish, id at 4-60. Despite recognizing that these species could be present near project sites, the DEIS concludes without any basis that disturbances from construction would be temporary and minor. DEIS at 4-58. Construction that disrupts a single breeding or rearing season can be highly detrimental to a vulnerable species. The DEIS must explain why it finds that the impact would be minor and discuss the impacts on the minority of species that could not relocate, because they were breeding, or for any other reason. This is especially important for the red-cockaded woodpecker and bald eagle. The DEIS notes that both of these animals could be found in undeveloped forested areas and wetlands adjacent to the proposed pipeline routes and then later notes that species in exactly these areas could be affected by noise and be dislocated, but does not discuss the impacts on these endangered species. DEIS at 4-58.

Response: DOE, through an independent evaluation of the site investigations by Leucadia and Denbury consultants, undertook habitat evaluations, independently reviewed Louisiana Natural Heritage Program data bases and site conditions, and also coordinated with USFWS Baton Rouge field office in order to conclude that impacts to threatened and endangered species would be minor.

The Draft EIS concludes that disturbances to protected species from construction of the water supply and hydrogen pipelines as referenced in the comment would be temporary and minor for several reasons. Section 3.6.4 states that no suitable habitat for the red-cockaded woodpecker, Louisiana black bear (*Ursus americanus luteolus*), Bald Eagle (*Haliaeetus leucocephalus*), or Sprague's Pipit (*Anthus spragueii*) exists on the project site or within 1 mile based on desktop surveys using current color aerial imagery to evaluate habitat type present, size, adjacent land uses and other factors affecting species presence. On March 26, 2013, the USFWS Louisiana Ecological Services concurred that the proposed project would not likely affect resources under the jurisdiction of Endangered Species Act (see Appendix C). As stated in Section 4.6.2.1.2, there is a potential for the red cockaded woodpecker to be located adjacent to the proposed pipeline corridor, therefore, there would only be potential for indirect, temporary, and minor impacts.

Section 4.6.2.1.2 states that the water supply and hydrogen pipeline routes would affect the local wildlife communities using forested habitats, specifically local resident and migratory terrestrial species. Leucadia minimized adverse impacts on biological resources by locating the pipeline corridors within or adjacent to existing utility ROWs to the extent practicable. Approximately 76% of the water supply pipeline route and 99% of the hydrogen pipeline route follows existing ROWs. Section 4.6.2.1.2 explains that relocation and use of alternative habitat are likely because of the availability of bottomland forest habitat and open marsh along the Calcasieu River, broad expanses of floodplain forested habitat, and freshwater marsh. Abundant, comparable habitat is available in the vicinity of the site. For these reasons, DOE concluded that overall, the loss of forested habitat itself would have a minor impact on wildlife and migratory bird species.

As inferred by the comment, the majority of birds would not use the site for nesting. The minority of species that may use the site but could not relocate--for example, because they were breeding--would be identified as part of federal and state permitting requirements. These requirements would include site-specific surveys, identification of wetlands and threatened and endangered species habitat, and mitigation, if applicable.

Comment 8-32: *The DEIS also determined that the harm would be minor because the majority of resident species have the ability to relocate. DEIS at 4-58. This casual assumption that other appropriate habitat is available is not supported by any analysis, such as whether that remaining habitat can support an increased concentration of a particular species, whether relocation would result in increased exposure to predation or manmade threats such as vehicle traffic, whether there are safe corridors of travel to the other habitat. Nor does the DEIS acknowledge that new oil and gas pipelines and other infrastructure are being built all over the Gulf Coast region, likely restricting the quality of the presumed alternative habitat for wildlife displaced by the project's CO_2 pipeline. Cumulative impact analysis is essential in these situations and completely absent from this DEIS.*

Response: The conclusion that impacts to resident species would be minor is based on multiple factors, not solely on their ability to relocate. The evaluation included an analysis of:

- Whether the resident species was likely to occur in the area impacted,
- How habitat would be impacted,
- The characteristics of remaining habitat available for use,
- The distance of the habitat from the project site, and
- The degree of habitat fragmentation, i.e. barriers that could affect relocation.

The resident species of concern that were considered in the evaluation were those that are valued in commercial and recreational hunting, such as game species, or those valued by bird watchers, other environmentalists, and the general public (see Tables 3.6-3 and 3.6-4).

The GIS analysis of current color aerial imagery of the Bayou D'Inde watershed, Houston River watershed, and Calcasieu River watershed was used to determine the remaining habitats that would be available to resident species and presence and type of barriers, i.e. roadways. For example, as discussed in Section 4.6.2.1.1, the forest is fragmented by Cities Service Highway (SH 108). This section has been updated to include Interstate 10 and explain that these features could restrict terrestrial animal movement to forests immediately adjacent to the project site.

As indicated in the DEIS, Section 4.6.2.1.1, the project is within approximately 1,740-acre forested area. The loss of 70 acres of forest for the LCCE Gasification plant represents 4% of the total area. The 40-acre equipment laydown and methanol/sulfuric acid storage area would potentially impact an additional 40 acres of similar plant community (i.e. forested habitat) as the 70-acre site, i.e. a mix of upland mixed hardwood-pine forest and bottomland cypress-tupelo swamp and freshwater marsh and represents an additional 2.3% loss (see Section 4.6.2.1.2). Therefore, 93.7% of the approximately 1,740-acre, or 1,630 acres of adjacent forested area would remain and provide a migratory or relocation corridor. Although Cities Service Highway and Interstate 10 represent barriers to terrestrial animal movement, they are not located immediately adjacent to the site and therefore would not restrict access to these forests.

The preferred CO_2 pipeline route is located within 1,323.6 acres of evergreen upland forest, 42.1 acres of mixed forest, and 2,288 acres of forested wetlands (see Table 3.6-2). The CO_2 pipeline route would impact 10.21 acres of evergreen upland forest and 1.96 acres of woody wetlands (see Table 4.6-2) or 0.77% of evergreen upland forest and 0.08% of forested woodlands.

As discussed in Section 5.3.2, cumulatively, the project, the connected action, and other foreseeable projects would result in a combined potential loss of 5.8% of remaining forest in the Upper Calcasieu River watershed and 0.3% within the Houston River watershed. This was considered a minor impact because sufficient suitable habitat would remain.

Comment 8-33: *The inquiry into the potential harm to protected species at the site of the West Hastings Oil Field is also inadequate. The DEIS lists several federal and State endangered and threatened species that are known to occur or could occur within the area but does not even discuss all of the species in its analysis. DEIS at 3-49 to 3-50. The DEIS does mention that the Texas horned lizard, a State threatened or endangered species, has a moderate likelihood of occurring on the West Hastings Field Oil site, but then omits any analysis of potential impacts to the species. DEIS at 3-50. With respect to more than a dozen imperiled plant species, the DEIS summarily concludes that these are not likely to be present on the site due to grazing and oil production—it is obvious that no site surveys have been conducted. Id. The DEIS is also dismissive of the possible use of this area as habitat during butterfly migration, because the insects would be there only "transiently." Id. This sparse analysis ignores that the adjacent coastal prairie habitat is also highly impacted by oil and gas development, which represents a massive cumulative loss of habitat for migratory insects and native plants. The DEIS must be revised following professional site surveys of the West Hastings oil field and any other oil field where CO_2 captured at the LCCE Gasification Plant is injected.*

Response: The research MVA activities are described in Section 2.3.2.3 and 2.5.4. Specifically, the activities potentially affecting vegetation or habitat would depend on the conditions at the existing well to be converted to a research MVA monitoring well, and some site cleanup of vegetation at the existing well pad may be required. Field work related to the well conversion activities would include temporary facilities and equipment placed at the ground surface within a previously disturbed area measuring approximately 150 feet by 150 feet in the immediate vicinity of each existing well to be converted. Project activities in Texas at the Hastings oil field would relate to re-working existing wells and be confined to existing roads and well pads in the Hastings oil field.

The Hastings Oil Field site was field surveyed for protected species in 2012. Prior to the field survey, federal and state databases were reviewed for potential protected species that may utilize the Hastings Oil Field vicinity. No protected species were observed in the project area or within a 5-mile radius. The Hastings oil field supports no sensitive habitat for endangered, threatened, or rare species (see Section 3.6.4).

The Texas horned lizard is not present on the Hastings oil field because habitat conditions for this species are not present. Habitat conditions have been modified by active oil field operations since 1934, as noted in See Section 2.3.2.3. Section 3.6.4 of the final EIS has been updated.

The activities that would occur at Hastings oil field would involve monitoring only and would be restricted to existing roads and well pad sites. Hence there would be no impacts to habitat areas.

Comment 8-34: *DOE states that it did some environmental impact analysis on all of the projects that sought funding under this DOE program. DEIS at 1-3. These analyses were provided to the "selecting official" for consideration when deciding among the projects, but it is unknown to what extent the environmental impacts of each project were actually considered in selecting*

among them. DOE refers to this earlier process as the reason none of the other projects that DOE could have funded are included in the DEIS alternatives analysis. If these other projects would have met the "purpose and need" cited in the DEIS, they should be evaluated in this document, and their environmental impacts compared to the proposed action. Otherwise, the public is presented with a fait accompli, contrary to the requirements of NEPA.

Response: DOE followed the regulations regarding analysis of projects under 10 CFR 1021.216. As specified in this regulation, the environmental critique, which included all eight projects that applied for funding, is subject to the confidentiality requirements of the procurement process. The publicly available document, the environmental synopsis, was prepared and made available as Appendix A to the EIS in accordance with 10 CFR 1021.216 (h-i). A full description of the project selection process is located in Section 1.1.2 of the EIS.

As described in Section 2.6.1.1, after DOE selects a project for an award, the range of reasonable alternatives becomes the project as proposed by the applicant, any alternatives still under consideration by the applicant, and the no action alternative. DOE's final decision, documented in a Record of Decision (ROD), is to either accept or reject the project as proposed by the proponent, including its proposed technology and selected sites. However, DOE may specify mitigation measures that would be required as part of the proposed project.

Comment 8-35: *There does not appear to be any reason that DOE cannot place a second request for bids that better match the goals of section 703, particularly those related to the capture of emissions of already existing sources. The DEIS has failed to consider all alternatives by failing to analyze other projects from a second request from bids. The DOE should continue to seek out projects that more appropriately meet the goals of carbon capture and sequestration by not creating an unaccountable new source of CO_2 emissions.*

Response: Section 1.1.1 describes the legislative history of Section 703 and has been expanded to provide additional information. The statutes creating and providing Congressional direction for the ICCS program are reflected in the technical requirements of the Funding Opportunity Announcement (FOA) for the ICCS Program. As described in Section 1.1.2, DOE issued a publicly-available Funding Opportunity Announcement on June 8, 2009. The open application period ended on August 7, 2009. All applications were accepted. The proposed projects were assessed both technically and environmentally during the competitive selection process. The twelve selected projects then prepared environmental and technical assessments as part of a project definition phase. Of the twelve eligible projects, eight applied for continued funding. The three selected projects meet all the requirements of the FOA and, by extension, the statutes.

Comment 8-36: *Denbury Resources is the company that Leucadia has contracted with to provide sequestration of the carbon dioxide captured by the proposed project. However, that company, as discussed in a July 25, 2013 Associated Press article attached to this letter, has a poor safety and environmental record with injecting carbon dioxide into oil wells. Several of Denbury's wells have blown out, resulting in dangerous amounts of CO_2 emissions. In some cases, emergency responders have had to wear breathing apparatus, deer and other animals have suffocated to death, and homes have been evacuated. These blowouts have had immediate serious impacts on the local environment by among other things, contaminating drinking water supplies. For example in a 2011 blowout in Yazoo County, Mississippi, a 2,000 foot deep hole*

released CO_2, oil, and drilling mud for 37 days. Denbury ultimately had to remove 27,000 tons of drilling mud and contaminated soil and 32,000 barrels of liquids from the site.

Aside from the obvious and serious public health and safety concerns associated with these kinds of accidents, Denbury's record clearly raises concerns about the effectiveness of its enhanced oil recovery operations at actually sequestering carbon for the short or long term. This new information supports the Sierra Club's initial concerns about human health and safety, environmental harm, and climate change related to the CCS Project.

DOE's statutory authority to provide hundreds of millions of dollars of financial assistance for the Lake Charles CCS project comes from a law that seeks to prevent further emissions of CO_2 in order to mitigate climate change. Denbury's dangerous history creates a real risk that the millions of tons of CO_2 intended to be stored through the CCS Project will be released back into the atmosphere. This potential for a huge release of CO_2 would not only defeat the purpose of the CCS project by further contributing to climate change, but would also be a serious threat to the environment and human health and safety. And to make matters worse, these risks would be happening near an area DOE has recognized as a potential environmental justice area. DEIS p. 4-90. The Sierra Club urges DOE to take a hard look at these real and very serious risks. The Sierra Club renews its request that DOE reject Leucadia's proposed project, or at the very least, issue a comprehensive revised DEIS that fully informs the public about the risks of Denbury's operations and allow for additional public hearings and public comment.

Response: As discussed in Section 1.5, EOR operations are outside the scope of the EIS because they are independent of DOE's decision on the proposed action. The proposed action includes a research MVA program which will supplement regulatory requirements and Denbury's commercial monitoring activities performed for Denbury's commercial EOR operations and will provide additional information regarding the movement and confinement of CO_2. The research MVA program will not increase the risk of a CO_2 release in commercial EOR operations. The ongoing commercial monitoring activities and the proposed research MVA program are designed to detect and prevent CO_2 releases.

The focus of the research MVA program on leak prevention and well integrity reflects DOE's experience and studies on multiple sequestration projects. In particular, the risk assessment performed for the FutureGen project, as described in Section 4.15.3, concluded that there could be a slow leak through undocumented wells over the 5,000-year sequestration lifetime. DOE's proposed action to provide funding for the Lake Charles CCS project would support the research on MVA techniques. These research MVA techniques are designed to detect subsurface movement in the formation and monitor for potential CO_2 migration above the target EOR zones, which when combined with current commercial monitoring activities could help prevent leaks. Demonstrating the efficacy of such research MVA techniques in the field as a supplement to current regulatory requirements and commercial best practices would encourage deployment of those research MVA techniques found to be beneficial.

9 Commenter: Martin S. Mayer, U. S. Army Corps of Engineers, New Orleans District

Comment 9-1: *The information contained in the DEIS is insufficient to meet the NEPA requirements for Army regulatory actions under Section 10 of the Rivers and Harbors Act and/or Section 404 of the Clean Water Act for the specific actions identified therein. Each action and/or connected action associated with the overall project implementation will need to be evaluated by the appropriate Corps of Engineers District office for compliance with those requirements under governing regulation sand any necessary permits issued prior to construction of the individual components.*

Response: DOE contacted the Army Corps of Engineers and clarified that the Corps District Office intends to complete a review of the various permit applications for impacts under their own NEPA guidelines.

10 Commenter: Edith Erfling, U. S. Fish and Wildlife Service, Division of Ecological Services

Comment 10-1: *The United States Fish and Wildlife Service (Service) provided a March 2013 form letter responding to requests for threatened and endangered species, fish and wildlife, environmental, and/or aquatic resources information, comments and/or recommendations within the Clear Lake Ecological Service's area of responsibility. The form letter identified relevant laws, provided information on candidate species in Texas, migratory birds, colonial water bird rookeries, bald eagles; and wetlands, streams and other aquatic resources. The letter included the Suggested Priority of Migratory Bird Conservation Actions for Projects (March 9, 2010) and Best Management Practices for Projects Affecting Rivers, Streams and Tributaries.*

Response: Thank you for your comment. DOE has assumed that if USFWS Division of Ecological Services in Texas had objections, they would have been raised in their March 2013 letter.

Project activities in Texas would only include monitoring within the existing Hastings Oil Field. DOE's project activities in Texas involve the research MVA program. Denbury would not drill any new wells or construct any new facilities for the West Hastings research MVA program. Denbury and BEG would conduct the West Hastings research MVA activities using existing wells for monitoring wells and access these wells from existing roads. However, if during any phase of the proposed project, it is determined that a federally listed species might be adversely impacted, DOE will initiate further consultation with USFWS in accordance with the requirements of the ESA (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

11 Commenter - Kyle F. Balkum, State of Louisiana Department of Wildlife and Fisheries, Office of Wildlife

Comment 11-1: *LDWF recommends that the facility have an adequate stormwater runoff plan to ensure that storage capacity of any adjacent receiving wetland is not exceeded to the point that they are excessively inundated.*

Response: As described in Section 4.3, Leucadia submitted a Notice of Intent (NOI) CSW-G and obtained a Storm Water General Permit Associated with Construction Activity from the LDEQ for the gasification site. Leucadia also prepared a site-specific SWPPP. Section 2.5.1.2 describes Leucadia's plan to manage storm water during operations, including collecting and reusing the majority of storm water on the site. Storm water from the gasification equipment area would be collected in a concrete storm water tank. The tank would have a 1,000,000-gallon capacity to accommodate up to 6 inches of rainfall during a 24- hour period. For process areas, Leucadia would collect the initial storm water runoff in a 125,000 gallon capacity tank, also for reuse.

The potential floodplain impacts are addressed in response to Comment 8-26 and described in Section 4.4.2 and Appendix E Floodplain and Wetlands Assessment. The Calcasieu Parish Police Jury Division of Engineering evaluated the drainage maps of existing and proposed conditions as a result of the LCCE Gasification plant (formerly the Lake Charles Cogeneration project). The Calcasieu Parish Police Jury Division of Engineering concurred with the storm water management design and issued a waiver from additional analysis.

Comment 11-2: *LDWF previously commented (see attachment from Feb. 15, 2012) on the preferred CO_2 route in response to USACE public notice MVN-2012-00036-WII for Denbury Onshore, LLC. LDWF accepts the proposed preferred route, provided that recommendations made in that letter are adhered to and addressed by the applicant. LDWF has reviewed the alternative CO_2 route, as depicted in "Figure 2.3-1" of the DEIS. The LDWF concurs with the evaluation on page 2-50 that the alternative route would have more stream and wetland impacts than the preferred route, thus LDWF is amenable to the preferred CO_2 route.*

Response: Denbury reviewed the recommendations in the earlier February 2012 letter and confirmed that these are acceptable. Denbury will contact LDWF to request another database review in case new occurrences have been recorded in the vicinity of the project since their initial consultation.

Comment 11-3: *As depicted in "Figure 1-2", the water supply line will be installed adjacent to the preferred CO_2 route and existing rights-of-way (ROW). LDWF supports the propose alignment provided that they construction ROW width is 75' and the permanent ROW width is 30' in wetland areas. Should temporary access roads be required for construction activities in wetland areas, the applicant shall implement BMPs to ensure that adjacent wetlands and waterbodies are not impacted. Culverts shall be installed and maintained at stream crossings and drainage features to ensure that existing flow of surface water is uncompromised.*

Response: Section 4.4.2.1.2 describes Leucadia's plans to avoid impacts during construction and notes that Leucadia would perform construction in accordance with required federal and state permits and implement BMPs pursuant to the Storm Water Pollution Prevention Plan that

would be prepared. For example, Leucadia's intent is to use horizontal drilling to cross streams as to avoid potential wetlands and impedance to stream flow. If site specific surveys determine this is not feasible, appropriate measures, such as using culverts, will be taken to reduce impacts to stream flow. Section 4.4.2.1.2 of the final EIS will include the recommendations provided in the comment.

Comment 11-4: *The applicant requested and LDWF provided a T&E Species Review for the proposed activity on March 25, 2011 (see attachment to LDWF Letter). Since over two years have transpired since this initial T&E Species Review, LDWF recommends that the applicant follow-up with LDWF Natural Heritage Program staff to ensure that no new elements of conservation concern have been documented within the project vicinity. Please contact Ms. Carolyn Michon at 225-765-2357 for further information.*

Response: Denbury will contact LDWF to request another database review in case new occurrences have been recorded in the vicinity of the project since their initial consultation. Denbury will contact the USFWS to determine if additional coordination is needed.

12 Commenter: Salvador Salinas, U. S. Department of Agriculture, Natural Resources Conservation Service

Comment 12-1: *The project should have no significant adverse impact on the environment or natural resources in the area. We do not require any permits, easements, or approvals for activities such as this.*

Response: Thank you for your comment.

13 Commenter: Rhonda Smith, U. S. Environmental Protection Agency, Region 6, Office of Planning and Coordination

Comment 13-1: *It is EPA's position the pipeline crossings cannot be considered within the definition for "single and complete project" as defined at 33 CFR 330.2(i). As such, impacts of the pipeline and other facilities associated with the proposed project must all be evaluated and included within the CWA 404(b)(1) Guidelines Analysis, and all wetland impacts must be mitigated under the one individual CWA 404 permit for the project. We ask for detailed discussion on the matter in the FEIS.*

Response: The U. S. Army Corps of Engineers issues nationwide permits under 33 CFR part 330 to authorize certain activities that require Department of Army permits under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbor Act of 1899. The NWPs authorize activities that have minimal individual and cumulative adverse environmental effects. DOE is following the USACE permitting guidelines in our DEIS; however, the ultimate permitting (and mitigation) decisions for wetland impacts will be made by the New Orleans District of the Army Corps of Engineers.

Comment 13-2: *Although EPA acknowledges that the potential environmental impacts of the project will be addressed by the applicable permitting authorities (e.g. TCEQ, LEDQ, and EPA Region 6) through the various permitting actions, approvals and studies as required by law, EPA recommends the FEIS provide more detailed discussion of waste disposal, specifically as it relates to the disposal of hazardous materials be included in the FEIS. Any potential air quality related impacts from disposal and associated transport activities should be discussed.*

Response: Section 4.12.2 of the EIS discusses waste generation and disposal. As noted therein, the project will produce very small quantities of hazardous waste during construction and operation. Potentially hazardous wastes that could be generated during construction would be properly collected, sampled and characterized. Wastes listed or characterized as hazardous would be labeled, packaged and temporarily stored in a designated hazardous waste accumulation area. Permitted hazardous waste transporters would transport hazardous wastes that could not be recycled off-site to the Waste Management Company's Lake Charles Hazardous Waste Facility in Sulphur, Louisiana or to a similarly regulated treatment, storage and disposal facility (TSDF) for proper disposal. A list of all the waste facilities in the vicinity of the project can be found in Table 3.12-1 of the EIS.

As discussed in Section 2.5.1, approximately 81 vehicles would access the site daily to remove waste materials for disposal, export products, or to deliver materials. The 81 vehicles accessing the site were considered in aggregate for CO_2 emissions and result in 713 short tons of CO2e annually. Section 4.2.5 of the final EIS includes this additional analysis.

Comment 13-3: *The DEIS states that the exact location of the equipment laydown and methanol/sulfuric acid storage area would have minor relevance to the evaluation of reasonably foreseeable adverse impacts to the environment. EPA does not concur with this statement and recommends that the laydown area be identified and studied. A more detailed discussion should be presented regarding safeguards against any possible adverse air impacts associated with the storage of methanol and sulfuric acid, and identify persons at risk, including construction and plant personnel. Specifics should include a discussion of all applicable requirements for storage of these materials. Further discussion on this matter should be included in the FEIS.*

Response: Issues associated the location of the equipment laydown are addressed in the response to Comment 2-6.

Sections 4.13.2.1and 4.13.2.2 discuss how hazardous materials would be handled and stored during construction and operation of the LCCE Gasification Plant as well as the plans that would be implemented to prevent releases and accidents. Sections 4.14.2.1 and 4.14.3.1 discusses the potential risk to human health and safety from the construction and operations of the LCCE Gasification Plant, including offsite storage, and the safeguards that would be in place to prevent or mitigate these risks during normal and accident conditions.

The following paragraphs summarize the applicable requirements for storage of methanol and sulfuric acid.

For all phases of the project, toxic or flammable materials would be handled and stored in compliance with EPA and Occupational Safety and Health Administration (OSHA) regulations and the National Fire Protection Association's *Guide on Hazardous Materials*.

Construction
As discussed in Sections 4.13.2.1, 4.13.3.2.1, 4.14.2.1, and 4.14.4, construction of the storage area would involve several types of heavy equipment and experienced personnel necessary to erect the structures for the facilities. The occupational exposure risks would be typical for an industrial construction project. Before construction activities begin, Leucadia would implement a worker protection program and would require all contractors to develop, implement, and maintain a Worker Protection Plan per OSHA Construction Industry Standards, as defined in 29 CFR Part 1926. This safety and accident prevention program would provide specifically defined goals and objectives for the safety, health, and welfare of all employees and protection of the public during construction activities. The program would comply with and complement federal, state, and local regulations. Leucadia would implement site access procedures during construction to prevent unauthorized entry to the construction area, including perimeter fencing and gated access for the site and the off-site laydown area.

Operations
All chemical storage tanks would be designed of compatible materials with safety systems installed and maintained, including emergency shutdown (ESD) shutoff valves. Tank storage areas would be equipped with appropriate fire suppression systems. All above ground storage tanks (ASTs) would be located in secondary containment to contain the 10-year, 24-hour rainfall event and spillage from leaks. ASTs would be inspected by staff routinely for leaks, corrosion, and other maintenance requirements in accordance with a site-specific SPCC Plan (Section 4.13.2.2).

The design of the methanol storage tanks would have to comply with applicable standards of the NFPA 1 (Uniform Fire Code) and NFPA 30 (Flammable and Combustible Liquids Code), as well as American Petroleum Institute and ASTM specifications. The carbon steel tanks would be equipped with coatings and cathodic protection to minimize corrosion. Safeguards that will be used to control against potential ignition sources include proper siting, electrical grounding, berming, and flame arresters. The methanol storage areas would be equipped with appropriate fire suppression systems In addition, Leucadia's operating plans include an integrated approach to controlling the risks of methanol releases and fires through the use of fire and gas detection equipment, ESD, blow-down, active fire protection and fireproofing (Section 4.15.2.1).

The sulfuric acid storage tanks would be designed to comply with applicable standards of the American Petroleum Institute and ASTM specifications. The carbon steel tanks would be equipped with coatings to minimize corrosion (Section 4.15.2.1).

Other safeguards that would be implemented include Leucadia's storage tank practices and Preventive Maintenance and Inspection Program that is described in Section 4.13.2.2.

Comment 13-4: *EPA recommends that, in addition to all applicable local, state, or federal requirements, additional mitigation measures be included as applicable in a construction emissions mitigation plan or similar document in order to reduce air quality impacts associated with emissions of NOx, CO, CO_2, PM, SO_2 and other pollutants from construction related activities. The listed mitigation measures include fugitive dust source controls and mobile, stationary source controls, and administrative controls.*

Fugitive Dust Source Controls:

- *Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative where appropriate at active and inactive sites during workdays, weekends, holidays, and windy conditions;*
- *Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions; and*
- *Prevent spillage when hauling material and operating non-earthmoving equipment and limit speeds to 15 miles per hour. Limit speed of earth-moving equipment to 10 mph.*

Mobile and Stationary Source Controls:

- *Plan construction scheduling to minimize vehicle trips;*
- *Limit idling of heavy equipment to less than 5 minutes and verify through unscheduled inspections;*
- *Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, prevent tampering, and conduct unscheduled inspections to ensure these measures are followed;*
- *If practicable, utilize new, clean equipment meeting the most stringent of applicable Federal or State Standards. In general, commit to the best available emissions control technology. Tier 4 engines should be used for project construction equipment to the maximum extent feasible;*
- *Lacking availability of non-road construction equipment that meets Tier 4 engine standards, the responsible agency should commit to using EPA-verified particulate traps, oxidation catalysts and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants at the construction site; and*
- *Consider alternative fuels and energy sources such as natural gas and electricity (plug-in or battery).*

Administrative Controls:

- *Prepare an inventory of all equipment prior to construction and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking;*
- *Develop a construction traffic and parking management plan that maintains traffic flow and plan construction to minimize vehicle trips; and*
- *Identify sensitive receptors in the project area, such as children, elderly, and infirmed, and specify the means by which impacts to these populations will be minimized (e.g. locate construction equipment and staging zones away from sensitive receptors and building air intakes.)*

Response: Leucadia has stated that best management practices will be applied during construction in order to minimize air quality impacts. Leucadia would implement the Fugitive Dust Source Control measures as described in the comment. With regard to Mobile and Stationary Source Controls described in the comment, Leucadia would use a parking area for construction employees located approximately 3 miles from the LCCE Gasification site (see Section 2.4.1 (Project Description) and 4.10.2.1 (Traffic and Transportation)). Leucadia would also implement the following BMPs for Mobile and Stationary Source Controls:

- Limit idling of heavy equipment to less than 5 minutes and verify through inspections;
- Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, prevent tampering to the extent possible; and

- New equipment will be used where practicable, older equipment will be maintained to its applicable standard including Tier 4.

Regarding Administrative Controls described in the comment, Leucadia initiated site preparation activities in January 2010, as described in Section 2.4.1. Leucadia's construction traffic and parking management plan to minimize vehicle trips is the use of a remote parking site with busing. A plan for minimizing impacts to sensitive receptors in the project area was not necessary because no schools, churches, or hospitals are located within 2 miles of the LCCE Gasification site or Lake Charles CCS CO_2 Capture and Compression facilities. The nearest residential zoned area is approximately 1 mile to the east, across the Calcasieu River and Prien Lake. A few residences are located approximately 0.75 miles north. As noted in Section 4.14.2.1, potential impacts on the general public would not be expected during construction because there would not be exposure to chemical or industrial hazards or contaminants that would exceed public health standards.

Comment 13-5: *Regarding the CO_2 pipeline route, 14 census block groups in Census Tract 27 were identified as potential environmental justice areas. The FEIS should provide information on communications, outreach, programs, and procedures that will be implemented to specifically mitigate impacts to vulnerable populations.*

Response: Leucadia and Denbury would initiate the same outreach procedures for all populations in the project area. While the populations of 14 census block groups in Census Tract 27 meet the standard for environmental justice, no disproportionately adverse impacts from the proposed project were found to occur in these areas.

Denbury's plans for communication with affected populations during construction are briefly described in Sections 2.3.2.2 and 4.14.3.2. Section 2.3.2.2 of the final EIS has been updated with additional information to provide additional information. Prior to construction and startup of the proposed CO_2 pipeline, Denbury will contact landowners that will be crossed by the pipeline or those landowners from which Denbury will need temporary workspace for construction of the pipeline. Denbury's land agents will first notify these landowners that Denbury is interested in acquiring an easement across their property and will provide them with information about the pipeline project. Denbury will also contact appropriate governmental agencies regarding applicable permits and approvals or that are otherwise affected by the pipeline project to provide these agencies with information about the pipeline project. Denbury's land agents are trained in the details of the pipeline project so they are able to answer questions that the landowners and governmental agencies may have. During this phase of the pipeline project, Denbury will maintain contact with the landowners and appropriate governmental agencies to address concerns and any site-specific construction stipulations. Once construction commences, Denbury's land agents will be in the field ahead of the construction crews to notify landowners and answer any other questions that may come up during construction.

Following construction and startup of the proposed pipeline, Denbury will comply with the DOT public awareness and damage prevention program set forth in 49 CFR 195, which require pipeline operators to implement written programs, increase awareness of and educate the affected public and key stakeholders on safe pipeline operations and excavation practices, and implement damage prevention measures. On an annual basis, Denbury mails public awareness brochures to the affected public and stakeholders containing information on the presence of

pipelines in their communities, recognizing and responding to a release, damage prevention activities, and safe excavation practices. Denbury's public awareness program is designed to help the public, contractors and others identify the location of pipelines before excavating to prevent third-party damages. Denbury and its pipeline affiliates are also members of one-call centers in the states where they operate their pipelines, and promote the nationally recognized "8-1-1 Call before you dig" campaign so that excavators, and even homeowners, make one-calls and are aware of efforts to protect underground utilities. See also responses to comments 8-18 and 8-19.

Impact minimization measures are described in Chapter 4 for each resource area and summarized in the tables at the end of each resource area section. For example, as summarized in Table 4.10-10, to minimize traffic and transportation impacts during CO_2 pipeline construction, Denbury would obtain regulatory and landowner approval to construct new access roads; and would provide notices to adjacent landowners regarding construction times, proper road signage and warnings, and road flaggers, and would maintain at least one travel lane at all times.

Comment 13-6: *Mossville, Louisiana is a predominantly African American environmental justice community near Lake Charles. EPA Region 6 has worked with Mossville since 1997 on health concerns, dioxin contamination, drinking water quality, flaring and releases by industry, and safety concerns due to proximity to industry. The DEIS indicates that the proposed CO_2 pipeline route is near Mossville. The FEIS should provide information supporting that coordination has occurred with Mossville, LA to discuss any potential impacts.*

Response: Issues expressed in this comment regarding Mossville are addressed in the responses to Comments 8-18 and 8-19. Although Mossville has been identified as an environmental justice community for other projects, no impacts from the proposed CO_2 pipeline would have a disproportionate impact on Mossville or any part of Census Tract 27. DOE used standard communication and coordination procedures for the Draft EIS, as described in Section 1.5.1. The response to comment 13-5 and Section 4.14.3.2 include Denbury's communication and coordination procedures during construction and operation of the CO_2 pipeline.

The unincorporated community of Mossville is served by the newspapers and libraries described in Section 1.5.1. No residents of Mossville requested copies of the Draft EIS.

Comment 13-7: *The proposed CO_2 pipeline is located in a rural, sparsely populated area including eight residences within 50 feet of the right-of-way. The DEIS does not indicate whether the residents of these 8 homes are identified as low income and/or minority, and therefore needing additional mitigation measures. DOE should provide information and training sessions on emergency procedures for residences living 50 feet of the right-of-way. DOE should also analyze appropriate socioeconomic information in order to determine whether these eight residences are a potential environmental justice area. DOE should then identify and implement any additional mitigation measures.*

Response: DOE performed a second evaluation of the area surrounding the CO_2 pipeline using updated geographical information and found four residences within 50 feet of the right-of-way. One residence is within Census Tract 32 and three residences are within Census Tract 23. These Census Tracts were not identified as potential environmental justice areas. Census data does not provide income or minority status information at the household level.

In accordance with the DOT federal safety regulations for transportation of hazardous liquids by pipeline, Denbury would add the CO_2 pipeline to its existing Integrity Management Plan, and maintain an Operations and Maintenance Manual containing procedures for normal operations, maintenance, abnormal operations, and emergencies. A description of these programs and procedures are provided in Section 4.13.3.2 of the DEIS.

The issues raised in this comment with respect to communications are addressed in responses to Comment 13-5. Emergency planning and notifications are described in Sections 4.13.2.2, 4.13.3.2, 4.14.2, and 4.14.3.

Comment 13-8: *DOE should coordinate with state-recognized tribes like the United Houma Nation and other local officials to discuss the project, potential impacts, and mitigation opportunities.*

Response: Executive Order 13175**,** *"Consultation and Coordination With Indian Tribal Governments,"* specifically defines an Indian tribe as those that the Secretary of the Interior acknowledges to exist as an Indian tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 479a. As required under EO 13175, DOE consulted with federally recognized tribes only. Federally recognized tribes are listed in Table 4.7.2. At the state level, DOE consulted the Louisiana SHPO. The United Houma Nation will be added to the list of interested public and receive a copy of the final EIS.

Comment 13-9: *EPA recommends that DOE continue to include all appropriate Native American tribes throughout the phases of the project.*

Response: Thank you for your comment.

14 Commenter: Stephen R. Spencer, U. S. Department of the Interior, Office of Environmental Policy and Compliance

Comment 14-1: *The US Department of the Interior has reviewed the subject notice. In this regard, we have no comment.*

Response: Thank you for your comment.

15 Commenter: Beth Altazan-Dixon, Louisiana Department of Environmental Quality, Office of the Secretary, Business and Community Outreach and Incentives Division

Comment 15-1: *The LDEQ has no objections based on the information provided in the submittal.*

Response: Thank you for your comment.

Comment 15-2: *Please take any necessary steps to obtain and/or update all necessary approvals and environmental permits regarding this proposed project. The comment identified permits required for a discharge to waters of the state, nonpoint source pollution from construction activities and storm water general permits for construction areas equal to or greater than one acre, sanitary wastewater treatment facility, a Sewage Sludge and Biosolids Use or Disposal; proposed work is located in wetlands or other areas subject to the jurisdiction of the U.S. Army Corps of Engineers. The comment identified requirements for protecting the groundwater of the region, water softeners that generate wastewaters that may require special limitations depending on local water quality considerations, and renovation or remodeling.*

Response: Thank you for your comment. Table 6.4.1 summarizes the required Federal and State Permits and Approvals and their status.

Comment 15-3: *If any solid or hazardous wastes, or soils and/or groundwater contaminated with hazardous constituents are encountered during the project, notification to LDEQ's Single-Point-of-Contact (SPOC) at (225) 219-3640 is required. Additionally, precautions should be taken to protect workers from these hazardous constituents.*

Response: The FEIS has been updated to include the following mitigation measure in Section 4.12.2.1. Leucadia would require its construction contractor and all subcontractors to prepare and follow a site-specific health and safety plan that complies with applicable state and federal regulations for identifying and managing solid and hazardous wastes, or soils and groundwater contaminated with hazardous constituents, including measures to minimize worker exposure to hazardous materials.

In the event that contaminated material is encountered Leucadia's procedures would include the following steps:

1. Suspend work in the area where the hazard exists/effects and initiate an investigation.
2. Identify and quantify the hazard using best industry practices and equipment.
3. Initiate the Site Emergency Action Plan or HAZWOPER (Hazardous Waste Operations & Emergency Response section 8.3 HSE Manual) or both.
4. Implement HAZWOPER for:
    a. Incident specific safety plan
    b. Preliminary evaluation of the site
    c. Hazards identification
    d. Monitoring of the hazard and the health of employees as dictated by the hazard
    e. Overall risk assessment
    f. Develop and employ Personal Protective Equipment and Personnel Protection Procedures
5. Notify the appropriate regulatory agencies.
6. Perform site remediation work.
7. Resume work once the site has been returned to a safe state and/or the regulatory agency clears the site.

16 Commenter: Noel Ardoin, State of Louisiana Department of Transportation and Development

Comment 16-1: *According to information in the EIS, several major State highways, including the interstate, will be impacted by the project. General information regarding permits needed for the Louisiana Department of Transportation and Development (DOTD) for pipeline crossings of State highways can be found on DOTD's web site at* *http://www.dotd.la.gov/highways/maintenance/maintmgt/home.aspx*

Response: Thank you for your comment. Table 6.4.1 summarizes the required Federal and State Permits and Approvals and their status. Issues expressed in this comment are addressed in the response to Comment 2-6 for the water supply and hydrogen pipelines.

17 Commenter: Jean Public, Citizen

Comment 17-1: *I do not believe this is good investment. I believe this is a waste of American tax dollars. Also the oil industry is so profitable they could pay for this themselves without taxpayers being gouged. The oil industry creates the carbon.*

Response: Thank you for your comment.

Comment 17-2: *The sequestered carbon can always arise with a huge explosion.*

Response: Issues expressed in this comment are addressed in the response to comments 8-36.

Comment 17-3: *I also believe the area is being polluted to too great a degree by all of this development.*

Response: Chapter 5 addresses the cumulative impacts to the area from the proposed project and connected action.

Comment 17-4: *There is also huge use of water which can cause issues for health since much of it is used to control dust (2-31).*

Response: Water would be used for multiple purposes, including dust control. As discussed in Section 4.4.2.1.1, Leucadia would purchase water for the construction of LCCE Gasification plant and parking area from the City of Sulphur. Section 2.4.1.1 describes the water requirements for construction including water needed for dust control and hydrostatic testing. Dust control is a mitigation measure to reduce the volume of particulates in the air for health and aesthetic reasons. The water volume used during construction of the plant and parking area would be 0.03% or less than 1 percent of the daily current available supply from the City of Sulphur, which would have a negligible impact on local water availability.

Table 2.4-1 lists the estimates of hydrostatic testing for each LCCE Gasification plant pipeline. Hydrostatic testing is done incrementally so these volumes of water would not be used in a single day or week. Water would be withdrawn from Bayou D'Inde, the Sabine Canal, and municipal sources for hydrostatic testing of the pipelines associated with LCCE Gasification. The water

needed for hydrostatic testing of the CO_2 pipeline would be obtained from local waterbodies and municipal sources, and would be reused for subsequent pressure tests, if practicable.

During operations, the LCCE Gasification plant would require 12 million gallons per day. As indicated in Section 3.4.1, water would be obtained from the Sabine River Diversion (SRD) System, which is operated by the Sabine River Authority in Louisiana. The SRA has determined that there is sufficient capacity to accommodate the Gasification plant's water needs. The issues raised in this comment with regard to water use are also addressed in the responses to Comments 8-24 and 8-25.

Comment 17-5: *(pg 3-44) Many bird species will be killed. All animals in the area will be brutalized and abused by this development. Red woodpecker and bears all lose homes and food source and lives.*

Response: The DEIS concluded that impacts to biological resources would be minor during construction and negligible during operations.

The preferred habitat of the red cockaded woodpecker is old-growth, fire maintained pine woodlands with little to no mid-story vegetation, as described in Section 3.6.4. These habitat conditions are not present within the project footprint which consists of upland evergreen forest, forested wetlands, mixed forest (see Section 3.6.1, Tables 3.6-1 and 3.6-2 of the EIS). The preferred habitat for the Louisiana black bear is large inaccessible tracts of bottomland hardwood forest.

Specific segments associated with the water supply pipeline route and hydrogen pipeline route would traverse large unfragmented forested tracts that could contain habitat for protected species. Prior to construction, Leucadia would conduct site surveys for permitting purposes. Should protected species or their habitat be present, Leucadia would initiate formal consultation with USFWS and take steps to avoid impacts to these species, which could include pipeline realignment. In addition, if construction occurs during nesting season, the Migratory Bird Treaty Act requires nest surveys prior to construction. If active nests are identified, then Leucadia would consult with USFWS for guidance.

The USFWS Louisiana Field Office concurred the project is not likely to adversely affect federal trust resources under their jurisdiction and currently protected species by the Endangered Species Act as indicated in their stamped and signed reply in Appendix C. USFWS Division of Ecological Services Houston, Texas did not raise any objections to the project from their review provided in March 2013. The issues raised in this comment are also addressed in the response to Comment 8-29 through 8-33.

Comment 17-6: *(4-31) The high pressure pipeline is a horror for Louisiana residents.*

Response: Section 4.14.3.1 discusses the potential risks to human health and safety from the operation of the pipelines and the safeguards that would be in place to prevent or mitigate these risks during the normal and accident conditions. Appendix G includes a discussion of the accident analysis conducted by Denbury for the CO_2 pipeline and the measures that they will implement to minimize risks in high consequence areas.

Comment 17-7: *(4-58) Forests are being cut down causing climate change issues and turning the site into a shrub habitat grassland and heat island.*

Response: As indicated in the DEIS, Sections 4.6.2.1.1 and 4.6.2.1.2, the project would occupy 110 acres within a 1,740-acre forested area; therefore 93.7% of the approximately 1,740-acre, or 1,630 acres of adjacent forested area would remain.

The preferred CO_2 pipeline route is located within 1,323.6 acres of evergreen upland forest, 42.1 acres of mixed forest, and 2,288 acres of forested wetlands (see Table 3.6-2). The CO_2 pipeline route would impact 10.21 acres of evergreen upland forest and 1.96 acres of woody wetlands (see Table 4.6-2) or 0.77% of evergreen upland forest and 0.08% of forested woodlands. The issues raised in this comment are also addressed in the response to Comment 8-32.

The change in land use for the acreage described above would result in loss of vegetation. DOE calculated the incremental change in CO_2e as a result of disturbance to soil carbon and vegetation loss to be 820 short tons CO_2 per year of plant operation. This analysis was added in Section 4.2.5 of the final EIS.

Comment 17-8: *(4-87) I take issue with local community gaining any money at all from this construction of the facility.*

Response: Thank you for your comment. Section 4.9 of the EIS discusses the socioeconomic impacts of the proposed project and connected action.

Comment 17-9: *(4-161) Much toxicity is being brought into this area so that the location will not be a desirable place to live.*

Response: As described in Section 2.3.1, the LCCE Gasification plant and Lake Charles CCS project CO_2 capture and compression equipment would be located on property zoned heavy industrial. As described in Section 3.13, no schools, churches, or hospitals are located within 2 miles of the LCCE Gasification plant or the Lake Charles CCS CO_2 Capture and Compression facilities. The nearest residential zoned area is approximately 1 mile to the east, and a few residences are located approximately 0.75 miles north of the proposed site. Table 3.13-2 provides a summary of the population and sensitive receptor information from the 2010 U.S. Census for the census tracts located within 1 mile of the LCCE Gasification plant. The study area contains fewer children under 5 and adults over 65 compared to the City of Sulphur, Calcasieu Parish, and the state of Louisiana.

The commenter's reference to page 4-161 described the methanol storage area and the release scenarios analyzed. As discussed in response to Comment 2-6, since publication of the draft EIS, Leucadia and the Port of Lake Charles identified a 120-acre area along Bayou D'Inde Road within which the equipment laydown area would be located during construction and which would be converted to the methanol and sulfuric acid storage area during operation. DOE assessed the total 120 acre area for potential impacts using desktop studies and updated the text of the final EIS accordingly.

Comment 17-10: *(5-25) The government is making quite an assumption that burying CO_2 will move oil to a more suitable site. That could be terribly wrong. There seem to be no guarantees to the public on this.*

Response: DOE's proposed action is described in Section 1.2 and does not include funding of the existing EOR operations at the West Hastings oil field. As described in Section 2.3.2.3, the oil and gas industry has more than 35 years of continuous experience in transporting and injecting CO_2 for enhanced oil recovery. This section further notes that the EPA reports that EOR was used in 80 oil fields in the U.S. in 2008, including 45 sites in Texas. Denbury began CO_2 injections in the West Hastings oil field on December 16, 2010.

Comment 17-11: *Taking so much out of the ground is causing earthquakes all over America. Other geological effects are being ignored in this plan.*

Response: Denbury currently performs CO_2 injection for EOR and ongoing commercial monitoring activities in the West Hastings oil field. As described in Section 1.5 of the draft EIS, the commercial EOR operations are independent of DOE's decision on the proposed project and are not included in the scope of the EIS. As part of the proposed project, Denbury and BEG will implement a research MVA program in a portion of the existing West Hastings oil field.to supplement regulatory requirements and commercial monitoring activities performed by Denbury for its ongoing commercial activities.

As discussed in Section 4.3.3.3 of the DEIS, none of the West Hastings Research MVA activities would produce vibrations or forces that would result in seismic destabilization, and no geologic hazards would be aggravated by the West Hastings Research MVA activities. Further, as set forth below, seismic events from the commercial EOR operations are unlikely.

In a conventional oil or gas reservoir the oil and water in the pore spaces of the rock are usually under significant natural pressure and flow to the surface when penetrated by a well bore, generally aided by pumping. Oil or gas reservoirs often reach a point when insufficient pressure (even while pumping) exists to allow sufficient recovery of reservoir fluids. Various technologies, including secondary recovery and tertiary recovery (the latter is often referred to as enhanced oil recovery [EOR], which is the term used hereafter), can be used to extract some of the remaining oil and gas. Secondary recovery and EOR technologies both involve injection of fluids into the subsurface to push more of the trapped oil and gas out of the pore spaces in the reservoir and to maintain reservoir pore pressure. Secondary recovery often uses water injection or "waterflooding" and EOR technologies may inject carbon dioxide (CO_2).

Naturally occurring earthquakes result from abrupt shifts along faults in the rock deep in the earth's crust. Naturally occurring earthquakes are referred to scientifically as "seismic" events because the abrupt shift causes vibrations in the earth. If the abrupt shift is large enough, the seismic event can be felt by people. Small shifts occur naturally much more frequently than large shifts, but are still called seismic events because they cause vibrations, even though the vibrations are so small that they can only be detected by sensitive instruments. Sometimes the term "micro-seismic" is used to distinguish such events from those which can be felt. The threshold for a "felt" seismic event is between Magnitude (M) M2 and M3.

If a seismic event can be attributed to human activities it is referred to as an "induced seismic event." Though rare compared to natural seismicity, induced seismicity has been attributed to a range of human activities including the impoundment of large reservoirs behind dams, underground mining, controlled explosions related to construction, and injection or withdrawal of fluids from the subsurface.

Felt seismic events attributable to oil production activities are very rare, although there are micro-seismic events that are so small that they may compare to someone dropping their purse on the floor in another room in the house.

According to a recent report on induced seismicity by the National Research Council (NRC 2012), conventional oil and gas production activities (involving only fluid withdrawal) from about 6,000 fields and hundreds of thousands of wells across the United States, resulted in 20 sites identified where felt seismic events have been attributed to extraction activities. There have been 18 sites across the United States at which felt seismic events have been attributed to secondary recovery activities. These sites represent a tiny fraction of wells used for secondary recovery – the NRC committee reported that approximately 108,000 wells are in operation today – while the number of events extends over a total period of decades.

Among the tens of thousands of wells used for EOR in the United States (about 13,000 currently in operation), the committee did not find any documentation in the published literature of felt induced seismicity, nor were any instances raised by experts in the field with whom the committee communicated during the study.

The NRC committee identified changes in pressure in the fluids in the pore spaces of the rock as the physical mechanism responsible for the induced seismicity associated with both conventional hydrocarbon extraction and secondary recovery operations. In the case of secondary recovery operations, the mechanism was pore pressure increase, and for conventional extraction it was pore pressure decrease. Analyses have shown that if faults or fractures are present and the pore pressure changes are excessive, abrupt shifts along faults or fractures with particular orientations could occur.

References:
National Research Council (NRC). 2012. Induced Seismicity Potential in Energy Technologies: The National Academies Press, Washington, D.C., 228 p. Available at: http://www.nap.edu/openbook.php?record_id=13355. Accessed on October 3, 2013.

Comment 17-12: *(5-28) Construction cost bolster an economy for a while- a short while. When construction is over economic effect diminishes to zero. This construction does not help the local economy over the long term.*

Response: As noted in Section 4.9 of the FEIS, the proposed project and connected action are not expected to have any long-term impact on local population levels, employment, demand on community services, or economy. Operation over the expected life-span of the LCCE Gasification plant will result in a minor beneficial impact on local employment over the long term.

Comment 17-13: *All bibliography referenced is 40 to 50 years old and completely obsolete. Very obsolete references materials are objectionable. Bibliography so old it offers no perspective for 2013.*

Response:
DOE identified references with dates before the year 2000 and assessed whether more recent reference with similar or updated information was available. As a result, the following references will be added or deleted, in the appropriate sections of FEIS:

Section 3.3 (Geology and Soils)
Crenwelge, G.W., J.D. Crout, E.L. Griffin, M.L. Golden, and J.K. Baker. 1981. Soil Survey of Brazoria County, Texas. USDA Soil Conservation Service.

This Reference will be updated in FEIS to reflect the current USDA web based information system which was used and referenced in Figure 3.3-8. Soil surveys are being completed and published by the USDA on a continuing schedule. Brazoria County has a web survey at http://websoilsurvey.nrcs.usda.gov/app/.

Roy, A.J. and C.T. Midkiff. 1988. Soil Survey of Calcasieu Parish, Louisiana. U.S. Department of Agriculture, Soil Conservation Service.

This reference will be updated to reflect the current USDA web based information which was used and referenced in Figure 3.3-7. Calcasieu Parish has a web survey at http://websoilsurvey.nrcs.usda.gov/app/

Section 3.5 (Groundwater)
Lovelace, J. K. and P.M. Johnson. 1996. Water Use in Louisiana, 1995. Louisiana Department of Transportation and Development Water Resources Special Report no. 11, 127 p.

This reference will be updated in the FEIS with: Sargent, P. 2007. Water Use in Louisiana, 2005, Louisiana Department Of Transportation And Development Department Of Transportation And Development Water Resources, Special Report No. 16, 140 pages.

United States Geological Survey (USGS). 1989. Quality of Water in Freshwater Aquifers in Southwestern Louisiana

This updated reference will be provided in the FEIS: ECOLOGY AND ENVIRONMENT, INC. 2011. Recommendations for a Statewide Ground Water Management Plan, December 7, 2011. Prepared for: Office of Conservation Louisiana Department of Natural Resources.

Whitfield, M.S., Jr. 1975. Geohydrology of the Jasper and Evangeline aquifers of southwestern Louisiana: Louisiana Department of Public Works Water Resources Technical Bulletin 20, 72 p.

This updated reference will be provided in the FEIS: ECOLOGY AND ENVIRONMENT, INC. 2011. Recommendations for a Statewide Ground Water Management Plan, December 7, 2011. Prepared for: Office of Conservation Louisiana Department of Natural Resources.

Section 3.13 (Public Health and Safety)
Flury F, Zernik F [1931]. Schädliche gase dämpfe, nebel, rauch- und staubarten. Berlin, Germany: Verlag von Julius Springer, p. 299 (in German).

This reference will be removed as it was not used in the discussion presented in Section 3.13.

Section 4.5 (Groundwater Impacts)
Lovelace, J. K. and P.M. Johnson. 1996. Water Use in Louisiana, 1995: Louisiana Department of Transportation and Development Water resources, Special report no. 11, 127 p.

Sargent, B.P., and B.D McGee. 1998. Occurrence of nitrate and selected water-quality data, Chicot aquifer system in southwestern Louisiana, July 1994 through January 1996: Louisiana Department of Transportation and Development Water Resources Technical Report no. 64, 53 p. Available at: http://la.water.usgs.gov/publications/hydrostudies.html. Accessed on January 10, 2012

These references will be removed as they were not used in the discussion presented in Section 4.5.

Comment 17-14: *NETL letter of 8/15/12 I do not believe us taxpayers should be paying for this product.*

Response: Thank you for your comment.

18 Commenter: John Paul Williams, Gulf Coast Environmental Labor Coalition

Comment 18-a: *The DEIS failed to adequately and accurately describe:*

- *The likely and potential CO_2 (and equivalents, hereinafter CO_2) emissions from the project, and the potential climate change impacts from the project.* [Refer to Comments 18-1, 18-2, 18-3, 18-4]
- *The project's water pollution discharges* [Refer to Comments 18-5, 18-6]
- *The project's cumulative impacts on the area's air quality* [Refer to Comments 8-7, 18-8, 18-9, 18-11, 18-12, 18-13]
- *The project's potential impacts from hazardous materials* [Refer to Comments 18-14, 18-15, 18-16, and 18-17]

Response: This comment summarizes the issues raised in the balance of comments from this commenter. DOE addressed these issues individually in the responses to Comments 18-2 through 18-16, as indicated above.

Comment 18-1: *The Draft EIS presents many different figures for just how much uncontrolled CO_2 the plant will emit, from 4 million in the June 2012 announcement, to 5.2 million tons at p. 4-6, to 5.8 million tons at p. 2-42 in the DEIS. Without an accurate and consistent figure for the project's CO_2 emissions before, and after capture, reviewers are unable to determine whether the project meets its goals, and whether the stated and realized goals are appropriate for the*

expenditure of over one-quarter of a billion dollars of taxpayer money. These inconsistencies extend to the Draft EIS' claims at 4-5 that the plant is designed to capture 89% of its carbon dioxide (equivalents), which the DEIS also opines at 5-19 would allow emissions of 642,443 tons/year of CO_2. This tonnage of CO_2 emissions is not consistent with the other conflicting CO_2 emissions rates provided in the DEIS.

Response: The issues raised in the comment with respect to consistency of CO_2 estimates are also addressed in the response to Comment 3-4.

Comment 18-2: *Nor does the DEIS describe any restrictions imposed on the project developer which obligate them to capture any amount, or any percentage of CO_2, for any period. The DEIS says a project goal is to confirm that 1 million tons of CO_2 stays buried and accounted for. But the DEIS fails to plainly state the important details of the CO_2 capture and sequestration scheme. Only under extended cross-examination of DOE's hired experts prior to the public hearing, could reviewers discover that DOE only intends to require monitoring of the CO_2 sequestration for a single year, and that years' worth of monitoring would only take place on only a fraction of the affected Hastings oil fields grounds. That incomplete monitoring would then be extrapolated to estimate whether 1 million tons/years was indeed sequestered. While the DEIS strives to give the impression the Project will capture 89% of the CO_2 for the next 30 years, the unwritten and unspoken assumption is that the Project, at most, will only be under a legal obligation to actually capture any CO_2 for a period of a single year. If CO_2 capture, shipment, and sequestration proves problematic, or expensive, or the proffered price of CO_2 falls, the DEIS does not provide assurance that CO_2 will continue to be captured after one year. Reviewers who read the DEIS will likely assume the project is obligated to capture 89% of the CO_2 over the project's life. The DEIS contributes to that error by not setting out the likely and potential project performance.*

The DEIS also fails to discuss the contractual obligations, if any, of the Project's developer to capture any amount of CO_2 for any period, much less to capture 89% of the CO_2 for the life of the plant. Reviewers who were unable to attend the public hearings, and whom lacked the opportunity to question DOE's experts, would not be able to determine solely from reading the DEIS, that the project developer is only obligated to capture CO_2 and monitor its sequestration for a single year of its decades of operation.

Response: Please refer to Responses 2-5, 4-6, and 8-15 with regard to capture of CO_2. With regard to monitoring, Section 2.3.2.3 explains the research MVA program would be limited to a parcel of approximately 2.8 square miles and that the West Hastings oil field is approximately 25 square miles. In addition, Section 1.3 states that the proposed project was selected for its potential to demonstrate the next generation of technologies that will capture CO_2 emissions from industrial sources and either sequester or beneficially use the CO_2. It was not DOE's objective that selected projects commit to the demonstration of the technology for the life of the project.

Comment 18-3: *The DEIS misleads reviewers into thinking the project will capture 89% of the CO_2 for the project's life and will emit, at most, just over 600,000 t/y of CO_2. In reality the project could emit almost 6 million tons/year of CO_2 for decades, beginning in its 2nd year of operation, and that would be completely legal and apparently allowable under the conditions of the $261 million DOE grant to capture CO_2.*

Response: The issues expressed in this comment are addressed in the response to Comment 3-4 and 4-6 regarding the amount of CO_2 that would be captured.

Comment 18-4: *The DEIS failed to discuss the Project's potential impacts on climate change and the project goals, if the project abandons or reduces CO_2 capture at some point, and fails to capture 89% of CO_2 emissions. That would mean that the DOE's program to reduce CO_2 emissions will have actually helped finance the new operation of one of the largest sources of CO_2 in the entire state of Louisiana, which bristles with some of the largest industrial projects in the world. Supporting such a large new source of CO_2 emissions is a highly significant and adverse impact that should have been discussed in the DEIS. In summary, the Draft EIS has failed to provide a consistent description of the plant's controlled and uncontrolled CO_2 emissions, the percentage and tonnages of CO_2 capture that are possible or likely, the percentages and tonnages of capture that are actually required, and to discuss the possibility of no, or reduced CO_2 capture. The State air permit is the only actual regulatory document governing the plant's air emissions, and it does not require any carbon dioxide capture at all.*

Response: DOE agrees that the air permit issued by LDEQ does not require capture of CO_2 emissions. The issue of whether the capture will continue beyond the successful demonstration period is addressed in the response to Comment 4-6. Subsection 5.2.2 of the EIS analyzes the cumulative effects of CO_2 emissions relative to national CO_2e emissions and that emissions of GHGs from the proposed project would not, by themselves, have a direct impact on the global, regional, or local environment. The response to Comment 3-4 addresses the clarifications to overall CO_2e emissions for the proposed project and connected action.

Comment 18-5: *The DEIS claims at p. 2-42 that the plant will discharge about 1200 gallons per minute of waste water, which calculates to about 1.5 million gallons per day, or about 5.5 million liters per day. At page 4-35 we see that the waste water will be permitted to contain 65,000 mg/l of copper and 72,000 mg/l of mercury. That's roughly a permitted total of 137 grams or about 5 ounces of heavy metals per liter, (and almost 4 liters per gallon) or about a pound of heavy metals in every gallon. In other words, taking these figures at face value, the plant is permitted to discharge a total of about a million pounds of these two toxic metals per day in its waste water. That's beyond absurd. Table 4.4-5 also presented inaccurate and misleading figures for the Project's permitted concentrations of oil & grease, total organic carbon, and pH in its effluent. The Coalition asks the DOE to issue a supplemental DEIS that contains an accurate description of the project's waste water, and the likely impacts. The SDEIS should allow an additional 45 days for public comment on that document, since the SDEIS will be the reviewers' first chance to look at an accurate summary of water quality impacts. The SDEIS should also explain the source of the purported discharges of 72,000 mg/l of mercury and 65,000 mg/l of copper. The Project will include miles of piping from which copper could leach. The Project could include massive uncovered storage piles of pet coke from which metals could leach during rain storms. It's possible that the 65,000/72,000 mg/l or similar concentrations of metals could be discharged from these or other Project sources in relatively low volumes. The SDEIS should clearly identify any Project sources that will discharge effluent containing metals or other contaminants. The DEIS' currently flawed discussion of waste water discharges has failed to provide an accurate discussion, and serious consideration of the Project's likely potentially significant impacts on water resources from its apparent 1.5 million gallon/day discharge, assuming that figure in the DEIS, at least, was accurate.*

Response: Issues expressed in this comment are addressed in the response to Comment 3-1.

Comment 18-6: *The DEIS did not describe the status of the contaminated surface waters in the project vicinity and the degree to which the Project will cause and contribute to those problem. The DEIS failed to inform reviewers of the TMDL designations for the receiving waters of the Calcasieu Estuary. The Project owner admitted in September 28, 2009 correspondence that the Project's non-contact blowdown water could contain mercury and copper. The DEIS' failed to accurately describe this potential impact. The DEIS, at page 4-35, purports to discuss the environmental consequences of the Project's waste water discharges, but only states, in a single sentence, that Leucadia would comply with any pollution permit limits. That terse conclusion is not sufficient, especially given the known errors in the DEIS' water pollution discussion and the DEIS' inaccurate description of the pollution permit limits.*

Response: Leucadia designed the process with a zero-liquid discharge system and would not discharge process wastewaters during operation, such as described by the commenter, to the Calcasieu River. The zero liquid discharge system is described in Section 2.5.1.2 regarding outputs and wastes and 2.6.3.1 regarding alternatives to conventional wastewater treatment. With respect to both construction and operation, the EIS analyzed potential impacts considered the existing conditions of the Calcasieu Estuary and Total Maximum Daily Load (TMDL) designations.

The TMDL information is provided in the EIS. Section 3.4.1 describes the status of the contaminated surface waters in the project vicinity. Surface water quality in the project area is influenced by the surrounding industrial land uses and several segments of the Calcasieu River which flows to the Calcasieu Estuary. These water bodies were placed on the Louisiana 2004 Section 303(d) list of waterbodies (also known as the TMDL list) that are monitored for elevated levels of mercury, copper, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). The designations for water quality and use for the relevant surface waters were summarized in Table 3.4-1.

Section 3.4.2 describes the hazardous substances present in sediments in Bayou Verdine and Coon Island Loop based a study of historical releases from two refining facilities located along the bayou. The sediment contamination included heavy metals, PAHs, and volatile organic compounds (VOCs). The DEIS stated that these contaminants impacted primarily benthic resources and the NOAA assessment identified damages and restoration requirements for this bayou (NOAA 2012a). Additionally, Section 3.4.2 describes water quality status of the West Fork Calcasieu River, the Houston River, and Bayou d'Inde.

Section 4.4.2.1.1 discusses the fact that construction activities have the potential to introduce contaminants to storm water runoff through excavation, material delivery and storage, concrete washout, waste generation, and equipment and vehicle use and storage. As storm water runoff moves across the site surfaces, it picks up sediment particles or soil, but also collects oil and grease, and residue from materials used on the site as well as fuels, grease, and lubricants incidentally leaked from vehicles and equipment or accidentally spilled. Storm water from the site would discharge directly to the Calcasieu River Ship Channel via existing outfalls. Leucadia submitted a Notice of Intent (NOI) for a NPDES General Permit for Storm Water Discharges From Construction Activities to LDEQ and prepared an SWPPP. The General Permit and the Calcasieu Parish Police Jury Code of Ordinances, Division 4 - Storm Water Discharges from

Construction Activities require that storm water discharges not exceed specified TMDL levels in current water quality standards.

Sections 4.4.2 and 4.4.3 assess the impacts to water quality as a result of the construction and operations of the Gasification Plant and the Offsite Activities. Any wastewater discharge would be regulated and require permits. The permits require the implementation of either NPDES or SWPPP depending on the activity. Compliance with these permits and plans is intended to meet regulatory standards so that there would be no long-term degradation of the receiving water body. Therefore, although there will be discharges to water bodies, there would be only minor impacts.

Comment 18-7: *The Draft EIS refuses at 5-18 to study whether the gasification plant will cause or contribute to the local air pollution problems. The Draft EIS claimed the plant would cause an insignificant increase in pollution. But page 4-6 shows the plant will increase nitrogen oxides levels by 0.95 ug/m3, when the significance threshold is 1. So the plant is within a rounding error of causing a significant impact. Likewise sulfur oxides emissions will cause an increase of over 24.05 ug/m3 when the SIL threshold is just 25. The DEIS does not cite a NEPA regulation that deems emission impacts below the SIL to be unworthy of a cumulative impacts discussion. The Project area's current ozone concentrations are .073, ug/l, compared with the air quality standard of only .075, as an 8-hour average. So just a 3% increase in air pollution will cause violations of the Ozone standard, which will then cause significant and adverse human health problems. Breaking the Ozone limit also makes it much harder for new industry to site here. The Project operations will emit 180 tons/year of Ozone precursors. Construction, including related projects will emit another 1000+ tons of precursors, so the Project will degrade Ozone levels. Yet the Draft EIS refused to study whether this plant, in combination with the many other new smokestack industries that have applications pending, will cause that 3% increase in Ozone levels.*

Response: Issues expressed in this comment are addressed in the response to Comment 3-2.

Comment 18-8: *The Draft EIS listed only 4 upcoming projects at Table 5.1-1, for which the Leucadia project will have cumulative air quality impacts. That list was painfully incomplete. It includes the Sasol gas-to-liquids plant, but leaves off the operation of the new Sasol ethylene crackers or the expansion of the Westlake ethylene plant. It includes 3 LNG export terminals, but leaves off several other nearby LNG export terminal projects; the large Magnolia LNG and Golden Pass expansions, and the smaller Waller, Gasfin, and Venture Global LNG export terminals in Cameron Parish.*

Response: DOE identified potential projects by contacting regulatory and planning agencies in 2012. Several projects have announced plans since that time. In order to be included in the updated list in the final EIS, a proponent must have 1) submitted a site plan for review by a local planning agency, 2) submitted an application submitted to a regulatory agency for permit review, or 3) announced the project through a government agency by September 15, 2013. If a project was abandoned, it is no longer included in the analysis.

The updated cumulative impacts analysis in Chapter 5 includes the Magnolia LNG, Golden Pass, Waller, Gasfin, and Venture Global projects.

Comment 18-9: *Construction of the Project and related elements will also produce very large increases in air pollutant discharges; 363 t/y of NOx for the 3 years of project construction, and 766 tons of PM-2.5/10 for the water and hydrogen pipelines. While the emissions are temporary, these levels of pollution could cause local areas of non-attainment, for instance, for the 1-hour NOx or 24 hr. PM-2.5/10 standards. The DEIS should have analyzed for those potential impacts.*

Response: Sections 4.2.2 and 4.2.4 analyze construction emissions from the LCCE Gasification plant. Construction emissions are distributed over distance (e.g. length of the pipeline and area of the LCCE site) as opposed to emanating from a single motionless point. The initial dispersal of emissions combined with the additional dispersion of the emissions once they become airborne reduces the potential for local areas of non-attainment. The emission estimates for PM2.5/PM10 are very conservative in that they do not include the effect of applying dust mitigation measures (see Sections 4.2.2.2.1 and 4.2.3.2.1). Applying water or other dust suppression measures during construction can reduce dust emissions significantly. The Air Pollution Engineering Manual, second edition attributes 80% reduction to dust suppression measures.

Issues expressed in this comment regarding construction emissions are addressed in the response to Comment 13-4. Leucadia has supplemented the best management practices that were discussed in the EIS and Section 4.2.2.1.1 has been updated to reflect additional measures to minimize air quality impacts during construction:

Fugitive Dust Source Controls:

- The project site will not contain open storage piles of dry material.
- Install wind fencing and phase grading operations where appropriate and operate water trucks for stabilization of surfaces under windy conditions as necessary.
- Prevent spillage when hauling material and operating non-earthmoving equipment to the extent possible and limit speeds to 15 miles per hour. Limit speed of earth-moving equipment to 10 mph.

Mobile and Stationary Source Controls:

- The Project will use remote parking with buses to minimize vehicle trips to and from the site.
- Limit idling of heavy equipment to less than 5 minutes and verify through inspections
- Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, prevent tampering to the extent possible. New equipment will be used where practicable, older equipment will be maintained to its applicable standard

Comment 18-10: *DOE originally backed this project to manufacture synthetic natural gas from petroleum coke, and then recover and pipe the CO_2 to the Hastings oil fields. Despite the developer's extravagant claims to DOE in 2008 that natural gas was soaring to $12, the price of gas plummeted to below $3, destroying the developer's market plans. Leucadia then redesigned the plant to produce methanol, rather than synthetic natural gas. DOE seemed undaunted at Leucadia's appalling miscalculation of energy prices, and continued to back this plant when it altered its plans, to manufacture methanol from petcoke instead.*

Response: This comment addresses topics that are not relevant to the EIS. The project is a large-scale industrial carbon capture and storage project on the Gulf Coast producing valuable industrial chemicals from a waste product (petroleum coke). DOE selected the project based on these requirements of the FOA.

The project evolved to the production of alternative industrial chemicals (methanol and hydrogen) based on its successful negotiation of financeable, long-term commercial contracts. Sale of these alternative products required only modest changes in technology and design. The project uses the same fuel and gasification system as when originally proposed. The carbon capture process also uses the same technology as originally proposed, with modification to accommodate the requirements of the current product mix. While production of methanol and hydrogen rather than substitute natural gas did involve use of alternative downstream processes, the CO_2 compression system used for carbon sequestration and the downstream units for processing waste gases produced in the gasification process are unchanged. None of the process changes that were implemented fundamentally change the technology being utilized for the carbon capture and sequestration components of the project or its qualification under the FOA.

Regarding energy prices, note from historic monthly data that Henry Hub natural gas prices were over $13/MMBtu in October and December of 2005 and were over $12/MMBtu again in June of 2008 (EIA 2013). Thus, 2008 projections of $12/MMBtu natural gas were entirely consistent with market prices seen during that period.

References:
United States Energy Information Administration (EIA). 2013. Henry Hub Gulf Coast Natural Gas Spot Price. Available at: http://www.eia.gov/dnav/ng/hist/rngwhhdm.htm. Accessed on October 3, 2013.

Comment 18-11: *Because the Project's design has changed so radically, the DEIS may not have kept up with the changes. For instance the DEIS fails to inform reviewers that the Port of Lake Charles is supposed to crush the incoming petcoke and apparently transfer the crushed coke, via uncovered conveyor, to the Project site. (URS, March 2009, p 1-3) The DEIS thus fails to inform reviewers of the likely PM emissions, which would include toxic metals such as nickel, from the unloading, crushing, conveying, and dropping of the crushed petcoke.*

Response: As stated in section 2.3.1.1, pet coke would be transported to the LCCE Gasification plant via covered conveyor. The process description in the air permit for the pet coke transport system within the LCCE boundary states a covered conveyor and enclosed silos and storage bins will be used (see page 1-5, Lake Charles Cogeneration, LLC Title V and PSD permit application, September 2008). Particulate matter emissions would be reduced through use of a covered conveyor and enclosed silos and storage bins.

Comment 18-12: *Although proposed Best Management Practices would include enclosed storage of petcoke, the DEIS did not discuss potential BMPs and whether the coke would be enclosed, either at the Project or at the Port. Instead the DEIS conceded at 4-35 that "material handling and storage areas would be exposed to storm water," without discussing BMPs or alternatives that would reduce pollution from these sources. Open piles of coke "materials", if allowed, would also allow wind-blown air emissions which would include toxic metals. We were unable to find consideration of the coke crushing and storage emissions in the air permit.*

Response: Section 2.3.1.1 describes the pet coke handling process. The pet coke would be processed by size at the Dry Bulk Terminal at the Port of Lake Charles and transferred to the LCCE site using an elevated, covered conveyor system. Once on LCCE property, the pet coke would be stored in bins, enclosing the pet coke. A conveyor would move the pet coke from the bins to the slurry preparation area. At this point, the pet coke is mixed with water and fluxant in grinding mills. Since the pet coke will be wet, dust emissions would not occur during the grinding process. The air permit issued to the LCCE facility includes the listing of particulate matter emission standard regulations found in the Louisiana Administrative Code Title 33, Part III Air Quality as applicable to the coke handling system (and its spare), bottom ash silo, day bins, sand silo and sand day bins, and the rod mill air eductors (see page 6, table of applicable Louisiana and Federal Air Quality requirements, in the modified Part 70 operating permit dated 29 June 2012.

Other material handled on site would include fluxant and sand, which would be stored on-site in closed silos equipped with baghouses to control particulate emissions. Leucadia would not have open piles of petcoke, fluxant, or sand on-site.

Comment 18-13: *There will be additional truck traffic, with its resulting air quality and traffic impacts, to haul away 500 ton/day filter cake from the clarifier that processes the gasification process wastewater. The DEIS didn't identify that aspect of truck traffic at p. 2-37 so the Coalition is uncertain if it was taken into consideration.*

Response: Section 2.5.1 states that approximately 81 vehicles would access the site daily to remove waste materials for disposal, to export materials, or to deliver materials. Section 4.10.2.2 evaluated the traffic impacts of approximately 127 one-way truck trips daily. These trips are minimal compare to the annual average daily traffic counts as shown in Table 3.10-3.

The air quality aspect of the 81 trucks in aggregate is addressed in the response to Comment 13-2.

Comment 18-14: *The filter cake from the gasification wastewater clarifier is separate from the filter cake referenced in Table 2.5-3, which states there will be less than 2000 tons of filter cake generated from river water treatment. That Table fails to state that 2000 tons is the annual production. That table should clearly label the time period for the filter cake output for reviewers.*

Response: Table 2.5-3 identifies the "water treatment clarifier sludge filter cake" production estimated at <2,000 tons. Footnote 1 of the table refers to all quantities and states: "The annual production quantities are based on estimated capacity factor and availability. Wastewater quantities based on average ambient conditions per the water balance."

Comment 18-15: *Table 2.5-3 also fails to disclose the generation and disposal of 8 tons/day of Heavy Metals Precipitate, and its likely destiny and subsequent environmental risks. It also apparently underestimates the discharges of salts from process wastewater evaporation by 365 tons/year.*

Response: It appears that the commenter is using information from the March 2009 IT Questions Amended for the LPDES Permit Application, which previously reported 8 tpd (tons per day) of heavy metals precipitate during operation of the Lake Charles Cogeneration Project. The correct estimates of waste volumes are shown in Section 2.5.1.2 of the draft EIS. The LCCE Gasification plant would not produce Heavy Metals Precipitate.

Comment 18-16: *The Project will produce and store large amounts of methanol and sulfuric acid (and chlorine). These are extremely dangerous materials and releases of large quantities could produce catastrophic consequences. Yet the DEIS has jumped the gun, and gone to press without even knowing the location of the methanol and acid storage areas. Reviewers are thus denied access to vital details including the distances from the tank farm to residences or other sensitive receptors, the terrain, whether the proposed site contains wetlands, and whether it is adjacent to surface waters. The DEIS ay Table 4.15-3 claimed the chances of a storage tank release of these chemical is "Extremely Unlikely." But Sulfuric acid infamously ranked 4rd on a list of chemical releases ranked "serious" in one federal study, with 418 releases that caused a total of 8 deaths, 425 injuries, and 20 evacuations of a total of 14,145 persons. (Chemical Emergency Preparedness and Prevention Office, Report to Congress. EPA 550-R-93-002. Figure 1-13, p. 15). Methanol releases separately caused 9 deaths and 29 injuries from 49 releases that produced 3275 evacuates. Likewise, the DEIS considered the risk of a transportation-related release to be "Incredible," literally less than one chance in a million. But that still translated to 1546 transportation-related releases of sulfuric acid, and 652 releases of methanol, during the time period studied in the above-cited study. In summary, because of the potential serious impacts from the proposed offsite chemical storage, the DEIS should have been postponed until it could identify the proposed chemical storage site. Then the site could be analyzed for its risk to its neighbors, including but not limited to the accurate modeling of various sizes of chemical releases, and the area's ability to be rapidly and safely evacuated in the event of a large scale chemical release.*

Response: The location of the methanol and sulfuric acid storage area is addressed in the response to Comment 2-6.

Section 4.15 describes the probability of potential failures of storage tanks that could result in spills or releases. Although considered extremely unlikely, the potential impacts of spills were evaluated. It is important to note that additional analyses would be performed prior to operations, including modeling for releases of materials that exceed applicable thresholds, in accordance with the requirements of OSHA and EPA. As described in Section 4.13, the use, handling, and generation of hazardous materials are primarily regulated by OSHA through Process Safety Management (40 CFR 1910) and the EPA through Chemical Accident Prevention (40 CFR 68), including modeling of potential releases, development of risk management plans, and emergency response programs.

Comment 18-17: *Folks live within a mile of the Project so they are potentially at risk. The Aloha modeling in Appx. F showed impacts for 1.2 miles from a large methanol release, for 6 miles from a chlorine release, and no modeling for a sulfuric acid release. That modeling is further flawed because it could not take into consideration the actual terrain involved.*

Response: The Areal Locations of Hazardous Atmospheres (ALOHA) model is part of suite of software applications called CAMEO that is used widely to plan for and respond to chemical

emergencies. Specifically, "ALOHA is an atmospheric dispersion model used for evaluating releases of hazardous chemical vapors. ALOHA allows the user to estimate the downwind dispersion of a chemical cloud based on the toxicological/physical characteristics of the released chemical, atmospheric conditions, and specific circumstances of the release. ALOHA can estimate threat zones associated with several types of hazardous chemical releases, including toxic gas clouds, fires, and explosions" (EPA 2013).

The purpose of the ALOHA modeling for this project was to identify the potential risks associated with the proposed project. However, very conservative assumptions were used in the development of the accident release scenarios. As discussed in Appendix F, worst case atmospheric and climatic conditions were used. These conditions are unlikely. In addition, Leucadia and Denbury incorporated safeguards into the design of the facility and pipeline to reduce the potential of these accident scenarios, as described in Sections 4.14.2.1 and 4.14.3.1.

The DOE Office of Environmental, Safety, and Health designated ALOHA as one of six toolbox codes for safety analysis (DOE, 2004). DOE recognizes the limitations of ALOHA and uses judgment based on site observation and published guidance to select model options that have significant effects on plume dispersion characteristics where appropriate. DOE recognizes that these models are inherently flat-earth models, and perform best over regions of transport where there is minimal variation in terrain. Simple terrain is representative of the area around LCCE Gasification because the region is essentially flat. The ALOHA model includes options for rural and urban conditions which generally correspond to surface roughness. The urban condition was selected to reflect the surrounding structures of the industrial setting.

As stated in Section 4.15.2.1, sulfuric acid has very low volatility and would not be expected to result in an airborne mist or aerosol, or result in a fire, thus ALOHA does not apply and impacts to the air from a release were not modeled. The Haldor Topsoe process, described in Section 2.3.1.1, produces sulfuric acid in a concentration of less than 97.5%. At this concentration, sulfuric acid alone does not produce a plume in air due to its extremely low vapor pressure at ambient temperature. (Fuming sulfuric acid, which would have different air, health, and safety impacts, is greater than 97.5% concentration and would not be produced by this plant.) Section 4.13.2.2 describes the storage of sulfuric acid and Table 4.13-2 provides the Chemical Abstract Service number for the sulfuric acid that would be produced by the LCCE Gasification plant. Section 4.14.2.2 describes the human health and safety aspects of sulfuric acid storage and spills; and Section 4.15.2.1 describes the potential impacts of a spill.

It is important to note that additional analyses would be performed prior to operations, including modeling for releases of materials that exceed applicable thresholds. As described in Section 4.13, the use, handling, and generation of hazardous materials are primarily regulated by OSHA through Process Safety Management (40 CFR 1910) and the EPA through Chemical Accident Prevention (40 CFR 68), including modeling of potential releases, development of risk management plans, and emergency response programs.

References:
United States Environmental Protection Agency (EPA). 2013. Emergency Management. What Is the CAMEO software suite? Available at: http://www.epa.gov/osweroe1/content/cameo/what.htm#haz. Accessed on October 3, 2013.

United States Department of Energy (DOE). 2004. ALOHA Computer Code Application Guidance for Documented Safety Analysis Final Report. DOE-EH-4.2.1.3-ALOHA Code Guidance. Washington, DC. June 2004. Available at: http://www.doeal.gov/SWEIS/DOEDocuments/063%20Final_ALOHA_Guidance_Reportv52404.pdf. Accessed on October 3, 2013.

APPENDIX I

Environmental Justice Evaluation

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ENVIRONMENTAL JUSTICE EVALUATION

As a result of comments on the Draft EIS, DOE prepared this appendix to document the environmental justice evaluation process performed for census tracts identified as potential environmental justice areas and to demonstrate why there were no disproportionately high and adverse human health or environmental effects to residents of Mossville and Census Tract 27.

Mossville, Louisiana, is an African-American community within Census Tract 27. The EPA and the Agency for Toxic Substances and Disease Registry (ATSDR), the Louisiana Department of Health and Hospitals Section of Environmental Epidemiology and Toxicology (LDHH), and LDEQ have investigated potential health hazards based on current and historical releases to the environment (see Section 3.9.2). Due to the public concern and the health studies that have been conducted, DOE assessed whether Mossville should be identified as an environmental justice area for this EIS.

Analysis of environmental justice areas relies on census data to determine whether a population has higher percentages of minority, low-income, or Native American populations than the surrounding city, county, and state. Although Mossville is unincorporated, and census data is not available under that name, the environmental justice analysis in Section 4.9.2.2 of the EIS includes Mossville because it is part of Census Tract 27 for the CO_2 pipeline. The southern border of Mossville is 3.4 miles from the LCCE facility, but the proposed CO_2 pipeline route crosses through Mossville.

A NEPA environmental justice analysis must consider all census blocks equally when determining whether proposed action related impacts have "disproportionately high and adverse human health or environmental effects …. on minority populations and low-income populations." As discussed in Section 3.9.2, the study area for the environmental justice analysis for the LCCE Gasification plant consisted of 22 census tracts within an approximate 1-mile radius of the plant because most impacts would occur within this area. In fact, the majority of minor impacts would occur in the immediate vicinity of the proposed project. The census blocks within 1 mile of the study area of the LCCE Gasification plant did not qualify as environmental justice areas because the census block groups within the study area exhibit lower percentages of population living below the poverty level, minority population, or Hispanic population than in the city of Sulphur, the parish, or the state. The study area for the environmental justice analysis along the CO_2 pipeline route (Section 3.9.2.2) consisted of 211 census block groups within a 1-mile radius of the centerline of the proposed CO_2 pipeline route. Fourteen census block groups within Census Tract 27 included areas with significantly higher rates of minority and/or Hispanic populations than the city, parish, and state, and were designated as potential environmental justice areas. However, no substantial, unmitigated negative human health or environmental impacts resulting from construction and operation of the proposed CO_2 pipeline were identified in the EIS, therefore, there would be no disproportionate impacts on minority, Hispanic, and /or low-income residents (Section 4.9.3.2).

As a result, DOE determined that there were no disproportionately high and adverse human health or environmental effects to residents of Mossville and Census Tract 27 from construction

and operation of the LCCE Gasification plant, the plant water supply and hydrogen pipelines, and the proposed CO_2 pipeline. The tables below provide a summary of this review.

Table I-1 Summary of Environmental Impacts for LCCE Gasification and Analysis on Mossville Area

Resource Area	LCCE Gasification (Connected Action) Gasification Site and Off-site Activities	Analysis
Climate and Air Quality	**Construction**: **Negligible** Fugitive dust and vehicle and construction equipment emissions would be temporary and would not affect maintaining attainment with the ozone standard. **Operation: Minor** For all criteria pollutants, maximum modeled concentrations would not cause or contribute to any violation of the ambient air quality standards. The transport of petroleum coke would result in a reduction in emissions during shipment of 0.5 million tons per year of petroleum coke diverted.	As described in Section 4.2.2 of the DEIS, the air dispersion modeling performed for the construction and operation of the LCCE facility, indicated that the maximum concentrations for all criteria pollutants would not exceed the national ambient air quality standards (NAAQS) or the LDEQ ambient air standards (AAS) at any location. The LDEQ reviewed and approved the air modeling protocol. Similarly, the modeling results for air toxics, such as carbonyl sulfide, hydrogen sulfide, and sulfuric acid, which are regulated at the state level, indicated that all concentrations at all locations were significantly below the LDEQ AAS. For example, for carbonyl sulfide, which has an AAS of 582 $\mu g/m^3$, the highest concentration of 1.2 $\mu g/m^3$ was at the plant site and values at 1 mile ranged from 0.03 $\mu g/m^3$ to 0.06 $\mu g/m^3$. Census Tract 27 and Mossville, which start approximately 3.4 miles from the site, fell within the contour range of 0 to 0.03 $\mu g/m^3$. Further review of cumulative sources for hydrogen sulfide also resulted in concentrations below the LDEQ AAS at all locations.
Geology and Soils	**Construction: Negligible** Soil disturbance and stockpiling could be subject to erosion from both wind and water. Approximately 32 acres and 79 acres of prime farmland would be temporarily affected by the water supply and hydrogen pipeline construction, respectively. **Operation: Minor** Minor spills or leaks from vehicles and material storage areas could impact soils.	The plant is approximately 3.4 miles from Mossville and Census Tract 27. The water supply and hydrogen pipelines run from the plant to within approximately 0.3, and 2 miles of Mossville and 0.2, and 0.4 miles of Census Tract 27. Therefore, any minor spills and leaks would not impact this area and there would be no disproportionate effects on these populations.

Table I-1 Summary of Environmental Impacts for LCCE Gasification and Analysis on Mossville Area

Resource Area	LCCE Gasification (Connected Action) Gasification Site and Off-site Activities	Analysis
Surface Water, Floodplains, and Wetlands	**Construction: Minor** Construction may introduce contaminants to storm water runoff through excavation, material delivery and storage, concrete washout, waste generation, and equipment and vehicle use and storage. Wetland impacts were addressed through off-site mitigation banking of 26.2 acres of the wetlands through an agreement between the Port of Lake Charles and Stream Wetland Services, LLC. Water required for construction of the parking area would include one water truck supplying an average of 2,000 gallons per day for 3 years. Additional floodplain and wetland impacts may occur at the 40 acre site of the equipment laydown area and methanol/sulfuric acid storage are dependent on the final location selected. The water supply pipeline would cross Bayou d'Inde and Bayou Verdine and impact 3.55 acres of wetlands. The hydrogen pipeline would cross Bayou d'Inde, the Sabine River Canal, and two additional waterbodies using HDD construction methods and impact 3.59 acres of wetlands. Hydrostatic testing of the water supply and hydrogen pipelines would approximately require approximately 193,600 and 412,890 gallons, respectively. **Operation: Negligible** Operation would use an annual average maximum of 8,500 GPM, or 12.2 million gallons per day of raw water from Sabine River. Wastewater, including cooling tower blowdown, water treatment reject, and plant drains and would be discharged as directed by the LDEQ LPDES Water Discharge Permit LA0124541 and AI No. 160213.	The plant is approximately 3.4 miles from Mossville and Census Tract 27. The water supply and hydrogen pipelines run from the plant to within approximately 0.3, and 2 miles of Mossville and 0.2, and 0.4 miles of Census Tract 27, respectively. Therefore, the population would not be disproportionately affected by storm water runoff or impacts on wetlands or water bodies.

Table I-1 Summary of Environmental Impacts for LCCE Gasification and Analysis on Mossville Area

Resource Area	LCCE Gasification (Connected Action) Gasification Site and Off-site Activities	Analysis
Groundwater	**Construction: Negligible** Horizontal directional drilling for the water supply and hydrogen pipelines may intersect the shallow unconfined aquifer of the Calcasieu River basin. The area impacted by construction is small compared to the greater than 2 million acres size of the shallow groundwater recharge area. Small, incidental drips and leaks of fuels or lubricants could occur from construction equipment or vehicles. **Operation: Negligible** Small, incidental drips and leaks of fuels or lubricants could occur from vehicle traffic.	All impacts on groundwater from the project are negligible. As a result, the Mossville and Census Tract 27 populations would not be disproportionately affected by the project for this resource area.
Biology	**Construction: Minor** Approximately 70 acres of previously disturbed, industrial developed, open space land would be impacted. Clearing of the equipment laydown area could remove 40 acres of potential forested habitat. The water supply pipeline corridor would impact 18.47 and 62.74 acres, respectively of forest habitat potentially used by the red-cockaded woodpecker. Suitable habitat for colonial wading birds may be present along the pipeline route intersections with Bayou D'Inde and around the Houston River. **Operation: Negligible** Long-term maintenance of the hydrogen pipeline, if it occurs during the breeding season, could cause noise and dislocation of colonial wading birds and species in adjacent forested habitats if determined to be present.	The plant is approximately 3.4 miles from Mossville and Census Tract 27. The water supply and hydrogen pipelines run from the plant to within approximately 0.3, and 2 miles of Mossville and 0.2, and 0.4 miles of Census Tract 27, respectively. Therefore, the populations would not be disproportionately affected by impacts on biological resources.
Cultural Resources	**Construction: Minor** Destruction of the portion of archaeological site 16CU29 that is within the APE during ground disturbance associated with clearing, site preparation, and building activities. **Operation:** None	Archaeological site 16CU29 is within the plant boundaries and the plant is approximately 3.4 miles from Mossville and Census Tract 27; therefore, the population would not be disproportionately affected..

Table I-1 Summary of Environmental Impacts for LCCE Gasification and Analysis on Mossville Area

Resource Area	LCCE Gasification (Connected Action) Gasification Site and Off-site Activities	Analysis
Land Use	**Construction: Minor** The gasification plant would impact 70 acres of industrial property. The raw water pipeline would impact a total of 122 acres of land, including 24 acres of permanent ROW and 98 acres of temporary ROW. The hydrogen pipeline (excluding additional temporary workspace and contractor work sites not within the ROW) would impact a total of 77 acres of land, including 51 acres of permanent ROW and 26 acres of temporary ROW. Surrounding residents and businesses may experience temporary traffic congestion and increased noise and dust levels. **Operation: Negligible** Occasional maintenance may require access to buried portions of the water supply and hydrogen pipelines.	The plant is approximately 3.4 miles from Mossville and Census Tract 27. The water supply and hydrogen pipelines run from the plant to within approximately 0.3, and 2 miles of Mossville and 0.2, and 0.4 miles of Census Tract 27, respectively. Therefore, the populations would not be disproportionately affected by impacts on land use.
Socioeconomics and Environmental Justice	**Construction: Minor** Construction would temporarily increase employment in the region during the 36-month construction period and would require a peak of 900 workers on site and 2,500 in the surrounding area. The increase in demand for temporary housing would temporarily reduce vacancy rates for such properties throughout the region and would provide short-term economic benefits to owners of temporary housing in the region. **Operation: Minor** Operation would require 187 new permanent workers and approximately 90% of these additional workers would be hired from the existing local labor market 19 permanent workers would relocate to the area.	Increased employment and housing demands would impact populations surrounding the plant and pipeline areas in an equal manner, therefore there would be no disproportionate effects on Mossville or Census Tract 27 populations.

Table I-1 Summary of Environmental Impacts for LCCE Gasification and Analysis on Mossville Area

Resource Area	LCCE Gasification (Connected Action) Gasification Site and Off-site Activities	Analysis
Traffic and Transportation	**Construction: Minor** Approximately 500 workers would access the construction parking area using State Highway 108. Approximately 150 off-site construction vehicles would deliver concrete, asphalt, and equipment to the site daily during peak construction. Use of Ruth Street during peak construction would degrade LOS from E to F. **Operation: Negligible** Approximately 187 personnel would access the site during operation. Approximately 81 one-way truck trips would be access the site daily to remove waste materials or deliver materials.	The plant is approximately 3.4 miles from Mossville and Census Tract 27. The water supply and hydrogen pipelines run from the plant to within approximately 0.3, and 2 miles of Mossville and 0.2, and 0.4 miles of Census Tract 27, respectively. Increased traffic would impact populations surrounding the plant and pipelines in an equal manner, therefore there would be no disproportionate effects on Mossville or Census Tract 27 populations.
Noise	**Construction: Minor** Noise generating equipment includes various trucks and pile driving. Existing background level of 53 dBA exceeds the EPA guideline and noise during construction would increase imperceptibly. A variance may be required to conduct HDD activities in the evening or weekends within 165 feet of a residence or noise sensitive area of the water supply pipeline may require a variance from local ordinances. Noise impacts on the hydrogen pipeline corridor may exceed HUD guidelines. **Operation: Negligible** Leucadia equipment estimated sound power level at nearest noise-sensitive receptor of 58 dBA, which exceeds background of 53 dBA. Upon final design, Leucadia would incorporate noise mitigation measures such as sound enclosures, vent silencers, buffer zones, and strategic equipment placement, as practicable, into the design.	The plant is approximately 3.4 miles from Mossville and Census Tract 27. The water supply and hydrogen pipelines run from the plant to within approximately 0.3, and 2 miles of Mossville and 0.2, and 0.4 miles of Census Tract 27, respectively. Noise from plant construction would not be heard in Mossville. Noise from the pipeline construction would primarily affect residents closer to the pipelines throughout the entire length of the pipelines. Therefore, there would be no disproportionate effects on Mossville or Census Tract 27 populations.

Table I-1 Summary of Environmental Impacts for LCCE Gasification and Analysis on Mossville Area

Resource Area	LCCE Gasification (Connected Action) Gasification Site and Off-site Activities	Analysis
Wastes	**Construction: Negligible** Assuming no recycling of construction waste, approximately 2,640 cubic yards of nonhazardous waste and small quantities of hazardous waste would be generated annually during the 3-year construction period, or less than 0.0002% of the available landfill capacity in Calcasieu Parish. **Operation: Negligible** Assuming no recycling, approximately 65,000 tons (75,000 cubic yards) of nonhazardous waste generated annually during operation represents 0.6% of the total landfill capacity in Calcasieu Parish. Approximately 1,500 cubic yards of potentially hazardous waste would be generated annually during operation, or less than 0.03% of the capacity of the hazardous waste landfills in Calcasieu Parish.	All impacts on wastes from the project are negligible. As a result, the Mossville and Census Tract 27 populations would not be disproportionately affected by the project for this resource area.
Materials	**Construction: Minor** Construction materials would consist of concrete, wood, fuel, and steel. Construction materials and specialized construction equipment are readily available from in-state vendors and fabricators with additional regional vendors as necessary. Locally obtained materials would include crushed stone, sand, and lumber for the proposed facilities and temporary structures (e.g., enclosures, forms, and scaffolding). Construction would require small volumes of commercially available chemicals, including paints and materials for operations and maintaining vehicles, and equipment. **Operation: Negligible** Petcoke, fluxant, fuel, aqueous ammonia, and chlorine would be the primary materials used. Operation would use or produce industrial chemicals, including aqueous ammonia, methanol, sulfuric acid, hydrogen, and fuels.	Construction materials would be purchased from a variety of vendors both locally and throughout the state, therefore, the populations of Mossville and Census Tract 27 would not be disproportionately affected. Hazardous chemicals would be transported over a vast highway system and they would be used within the confines of the plant, therefore the population of Mossville and Census Tract 27 would not be disproportionately affected.

Table I-1 Summary of Environmental Impacts for LCCE Gasification and Analysis on Mossville Area

Resource Area	LCCE Gasification (Connected Action) Gasification Site and Off-site Activities	Analysis
Human Health and Safety	**Construction: Negligible** An estimated 84 OSHA recordable incidents and 46 lost work days would be anticipated during construction based on national incidence rates and the estimated 900 construction workers employed during peak construction. The public would not have access to the constructions area. Vehicle emissions would not expose sensitive receptors to substantial pollutant concentrations. **Operation**: **Negligible** An estimated 62 OSHA-recordable incidents and 34 lost work days would be anticipated during operation based on national incidence rates and the estimated 187 workers employed during the 30 year life of the plant. Based on fatality rates for petroleum refineries, the fatality rate would be below one (0.02) and no fatalities would be expected. Air emissions of criteria pollutants and toxic air pollutants do not cause or contribute to any violation of the NAAQS or LAAQS or expose sensitive receptors to substantial pollutant concentrations.	The public would not have access to the construction areas and all health and safety impacts from the project are negligible. Therefore, Mossville and Census Tract 27 would not be disproportionately affected by the project for this resource area. Impacts from an accident would primarily affect those populations closest to the plant. At a distance of 3.4 miles, the populations of Mossville and Census Tract 27 would not be disproportionately affected. Section 4.15 of the DEIS provides a detailed discussion of accident probability and potential impacts.

Table I-2 Summary of Environmental Impacts for CO_2 Pipeline and Analysis on Mossville Area

Resource Area	CO_2 Pipeline	Analysis
Climate and Air Quality	**Construction: Negligible** Fugitive dust and vehicle and construction equipment emissions would be temporary and have negligible impacts on air quality. **Operation: Negligible** Vehicle emissions would be temporary and have negligible impacts on air quality. Fugitive emissions of CO_2 from the pipeline would be below applicable regulatory thresholds for permitting.	The construction of the pipeline would have temporary and negligible effects over its entire length. Approximately 2.4 percent of the pipeline is within Mossville, and 34% is within Census Tract 27. These areas would not be disproportionately impacted. During operations, only temporary negligible impacts to air quality would occur along the pipeline route associated with maintenance and it is not possible to speculate where maintenance would occur. Fugitive CO_2 emissions could occur at any point along the pipeline route. Therefore, air quality in Mossville and Census Tract 27 would not be disproportionately impacted by the normal operations of the CO_2 pipeline.
Geology and Soils	**Construction: Minor** Soil disturbance and stockpiling could be subject to erosion from both wind and water. Approximately 107 acres of prime farmland would be temporarily affected. **Operation: Negligible** Any areas of soil exposed during construction of the CO_2 pipeline would be returned to their original condition and usage prior to operation.	Soil disturbance and stockpiling would occur along the entire length of the pipeline. Approximately 3 acres, or 2.8 percent, of the prime farmland is within Mossville and 41 acres, or 38%, is within Census Tract 27. Therefore, the prime farmland in these areas would not be disproportionately impacted.
Surface Water, Floodplains, and Wetlands	**Construction: Minor** The CO_2 pipeline would cross Bayou D'Inde and the Houston River using HDD construction methods. Pipeline route would potentially permanently impact 4.0 acres and temporarily impact 6.79 acres of wetland and permanently impact 14.98 acres and temporarily impact 13.23 acres of 100-year floodplain. Approximately 550,100 gallons of water for hydrostatic testing of the pipeline would be obtained from local water bodies or purchased from municipal supplies. **Operation: Negligible** Periodic maintenance and vehicle traffic would occur.	The pipeline crosses several water bodies and wetlands. These water bodies and wetland occur along the entire pipeline route and not exclusively in Census Tract 27. Although there would be impacts to surface water bodies and wetlands within Census Tract 27, the impacts will be mitigated through on-site restoration and the purchase of wetland credits from approved wetland mitigation banks. The impacts to surface water, floodplains, and wetlands are not disproportionate to Mossville or Census Tract 27.

Table I-2 Summary of Environmental Impacts for CO_2 Pipeline and Analysis on Mossville Area

Resource Area	CO_2 Pipeline	Analysis
Groundwater	**Construction: Negligible** Horizontal directional drilling may intersect the shallow unconfined aquifer (1 to 3 feet bgs) of the Calcasieu River basin. The area impacted by construction is small compared to the greater than 2 million acres size of the shallow groundwater recharge area. Small, incidental drips and leaks of fuels or lubricants from construction equipment or vehicles could occur during construction. **Operation: Negligible** Small, incidental drips and leaks of fuels or lubricants could occur during maintenance.	All impacts on groundwater from the project are negligible. As a result, the Mossville and Census Tract 27 populations would not be disproportionately affected by the project for this resource area.
Biology	**Construction: Minor** Pipeline construction would affect 10.21 acres of forest, 17.65 acres of scrub-shrub, and 2.1 acres of herbaceous grassland habitats. Biological surveys identified potential and confirmed colonial wading bird nesting area locations east of the CO_2 pipeline corridor. **Operation: Negligible** Long-term maintenance of the pipeline, if it occurs during the breeding season, could cause temporary noise and dislocation of colonial wading birds and species, if present in adjacent forested habitats.	The pipeline will be located along existing ROWs to the extent practicable. The habitats affected occur along the entire pipeline route and not exclusively in Mossville or Census Tract 27. The potential habitats for the colonial wading bird are not within the ROW of the pipeline.
Cultural Resources	**Construction: Minor** Archaeological site 16CU73 would be destroyed. The Hardey Family Cemetery may be impacted, but cemetery owners have indicated no objection if there are no surface operations and directional drilling is used beneath the cemetery, at a minimum depth of 25 feet below the surface. **Operation: Minor** The presence of the buried pipeline may alter the setting of the cemetery. Cemetery owners have indicated no objection.	Archaeological site 16CU73 is not within Census Tract 27 so there would be no disproportional impacts to Mossville or Census Tract 27.

Table I-2 Summary of Environmental Impacts for CO_2 Pipeline and Analysis on Mossville Area

Resource Area	CO_2 Pipeline	Analysis
Land Use	**Construction: Negligible** Construction would cause short term impacts to 50.62 acres of temporary ROW, which would be restored to previous conditions and uses. There would be long-term impacts to 56.34 acres, including 8.27 acres of forested land with 2.98 acres of forested wetland. **Operation: Negligible** Operation of the CO_2 pipeline would require that the area remain clear of woody vegetation and development. Where the pipeline ROW crosses private property, operation of the CO_2 pipeline would restrict landowner uses within the permanent pipeline ROW. Occasional maintenance may require access to buried portions of the pipeline.	The pipeline will be located along existing ROWs to the extent practicable. All impacts on land use from the project are negligible. As a result, the Mossville and Census Tract 27 populations would not be disproportionately affected by the project for this resource area.
Socioeconomics and Environmental Justice	**Construction: Minor** Construction would require an average of approximately 50 workers, with a total of 80 workers during peak construction periods. Demand for temporary housing such as hotel/motel rooms, RV sites, and other rental properties would increase providing a benefit to local providers. The area as a whole is not considered an environmental justice area; however certain census tracts have significantly higher proportions of minority and/or Hispanic populations and populations below the poverty level. **Operation: Negligible** Two additional workers would be hired to maintain and operate the proposed pipeline route. The workers would be hired locally and would not impact the total population in the Greater Lake Charles area.	Increased employment and housing demands would impact populations surrounding the plant and pipeline areas in an equal manner; therefore there would be no disproportionate effects on Mossville or Census Tract 27 populations.

Table I-2 Summary of Environmental Impacts for CO_2 Pipeline and Analysis on Mossville Area

Resource Area	CO_2 Pipeline	Analysis
Traffic and Transportation	**Construction: Minor** On average, approximately 100 personnel and 10 trucks would access the pipeline route daily during construction. **Operation: Negligible** Periodic maintenance of the ROW would include mowing and occasional maintenance activities that may require access to buried portions of the utilities.	Increased traffic would impact populations surrounding the pipeline in an equal manner; therefore there would be no disproportionate effects on Mossville or Census Tract 27 populations.
Noise	**Construction: Minor** Sound levels may exceed EPA and HUD guidelines at some residences during pipeline construction. HDD activities may need to be conducted in the evening or weekends within 165 feet of a residence or noise sensitive area, which is prohibited by Calcasieu Parish and Cameron Parish ordinances without a variance. **Operation: Negligible** Noise would be generated from equipment and vehicles used during pipeline inspection and maintenance activities. Estimated sound levels would not exceed ambient levels during operation of the pipeline.	The highest noise levels would be experienced by the four residences within the pipeline corridor. However, none of these are in Census Tract 27 or Mossville. Therefore, there would be no disproportionate effects on these areas.
Wastes	**Construction: Negligible** Following HDD operations, the bentonite slurry would be recycled, spread in upland areas as a soil supplement, if permitted, or removed and disposed of at a local permitted solid waste landfill. **Operation: Negligible** Waste generation would be limited to periodic ROW maintenance activities including mowing of ground cover, clearing of vegetation, maintenance of access and service roads, and servicing and monitoring of pipeline system components.	All impacts on wastes from the project are negligible. As a result, the Mossville and Census Tract 27 populations would not be disproportionately affected by the project for this resource area.

Table I-2 Summary of Environmental Impacts for CO_2 Pipeline and Analysis on Mossville Area

Resource Area	CO_2 Pipeline	Analysis
Materials	**Construction: Minor** Construction would require materials such as carbon steel pipe, valves, pumps, fittings, process materials, cathodic protection equipment, controls and monitoring systems. Also, fuel, lubricants, transmission fluids, and oils would be required for the operation and maintenance of equipment and vehicles. **Operation: Negligible** Supercritical CO_2, which flows like a liquid, would be transported via the pipeline. Fuel, lubricants, transmission fluids, and oils would be required for the operation and maintenance of equipment and vehicles used for routine maintenance and monitoring of the pipeline and pipeline system components.	The acquisition and use of materials would affect the entire population surrounding the pipeline areas in an equal manner; therefore there would be no disproportionate effects on Mossville or Census Tract 27 populations.
Human Health and Safety	**Construction: Negligible** An estimated 1.08 OSHA-recordable incident and 0.6 lost work days would be anticipated during the construction of the CO_2 pipeline based on national incidence rates and 250 employees during the peak construction period. Based on fatality rates for construction and extraction sector, the fatality rate would be below 1 at 0.01 and no fatalities would be expected. It is not expected that the public would be on site or be exposed to chemical or industrial hazards or contaminants that would exceed public health standards. **Operation: Negligible** Supercritical CO_2 would be transported via the pipeline. An estimated 1.35 OSHA-recordable incidents and 1.08 lost work days would be anticipated during a 30-year life of the pipeline, based on national incidence rates and the estimated number of workers employed during operation of the pipeline.	All impacts on health and safety from the project are negligible. As a result, the Mossville and Census Tract 27 populations would not be disproportionately affected by the project for this resource area.

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