STATE OF LOUISIANA
OFFICE OF CONSERVATION
BATON ROUGE, LOUISIANA

Basis for Decision

for

Denbury Low Carbon Solutions, LLC (D10126)
Draco IZM Well No. 001
Application No. 44308

Docket No. IMD 2023-04

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On June 29, 2023, Denbury Low Carbon Solutions, LLC (Denbury) submitted an application to the Injection and Mining Division (IMD) of the Louisiana Department of Natural Resources' (LDNR) Office of Conservation (OC) for a permit to drill a Class V stratigraphic test well at an approximate location of latitude of 30° 54' 11.51" North and longitude of 93° 0' 36.32" West (North American Datum of 1927 – Louisiana North) in Vernon Parish in order to collect geotechnical cores, fluid samples, static pressure measurements, and other applicable information.

The OC conducted a review of the above-referenced permit application and prepared a proposed permit decision. While the OC does not believe that a review of this application under the analysis articulated by *Save Ourselves, Inc. v. La. Env't Control Cmm'n*, 452 So. 2d 1152 (La. 1984) ("IT Analysis") is legally necessary as part of the final permit decision for a Class V stratigraphic test well, such a review has been completed for this Basis of Decision out of an abundance of caution.

After review of the complete application and due consideration of all comments received during the public comment period, the OC finds that, as part of its IT Analysis, any adverse environmental impacts have been minimized or avoided to the maximum extent possible. To make this determination, the OC finds that the above-referenced permit application complies with all applicable statutes and regulations and has otherwise minimized or avoided to the maximum extent possible any adverse environmental impacts. Additionally, the OC finds that Denbury has met the alternative projects, alternative sites, and mitigation measures requirements of an IT Analysis for the above-referenced application.

After the OC determined that any adverse environmental impacts had been minimized or avoided to the maximum extent possible, it balanced social and economic factors with environmental impacts. Notably, the Louisiana Constitution does not establish environmental protection as an exclusive goal, but instead requires a balancing process in which environmental costs and benefits must be given full and careful consideration along with economic, social, and other factors. Accordingly, the OC finds that the social and economic benefits of the proposed project will outweigh its adverse environmental impacts.

The details of the OC's reasoning are set forth below.

FINDINGS OF FACT

I. PROJECT SUMMARY

On June 29, 2023, Denbury submitted an application to the IMD for a permit to drill a Class V stratigraphic test well in order to collect geotechnical cores, fluid samples, static pressure measurements, and other information. The purpose of the stratigraphic test well is to collect subsurface information in order to evaluate the feasibility of developing a carbon capture and sequestration program in the area. After the proposed well is completed, it may be utilized as a monitoring well in the future if a sequestration project is developed.

The acquisition of geotechnical data is proposed to occur in the drilling and completion of this well. The proposed well is not presently permitted for the disposal of waste via injection. A step rate injection test will be performed using 15 minute steps, followed by a 10 hour injection period and 36 hour falloff monitor test will be run. All injected fluid will come from a water source well to be drilled on site.

The total depth of the well is approximately 11,616 feet below ground level (bgl). The base of the lowermost underground source of drinking water (USDW) is approximately 3,700 feet bgl. There are four (4) registered water wells located within a one-mile radius of the proposed well location. The principal regional aquifers in the area consist of the Chicot, Evangeline, Williamson Creek, and Carnahan Bayou Aquifers. Deeper aquifers underlying the Carnahan Bayou Aquifer contain only saltwater.

After conducting a review of the permit application, the OC prepared a draft permit decision. The draft permit conditions were based on applicable regulations as set forth in Statewide Order No. 29-N-1 (LAC 43:XVII, Subpart 1), as amended. Such regulations provide for the protection and non-endangerment of USDW and the permitting, drilling, completing, operating, and maintaining of Class I (nonhazardous waste), Class III, Class IV, and Class V injection wells in the State of Louisiana.

II. PUBLIC COMMENT

Public notice of the hearing was given on October 31, 2023, in *The Advocate*; *The News Leader* on November 3, 2023; and on November 2, 2023, by forwarding a copy of the public notice to the parish president of Vernon Parish and to interested parties. A copy of the list of interested parties may be requested by emailing injection-mining@la.gov.

A public hearing was held on December 7, 2023, at the Leesville Golf Course Reception Hall in Leesville, Louisiana. At the hearing, all interested parties were afforded the opportunity to present oral or written comments on the proposed permit action. The public comment period began on November 3, 2023, and ended on December 8, 2023.

The OC received one written comment and two oral comments during the public comment period. After reviewing and considering all comments received during the public hearing, the OC prepared a Response to Public Comments for all relevant comments, is attached hereto and made a part hereof.

III. AVOIDANCE OF ADVERSE ENVIRONMENTAL IMPACTS: Have the potential and real adverse environmental impacts been avoided to the maximum extent possible?

Potential and real adverse environmental effects were considered both in regard to the construction of the well itself and with respect to construction activities to be completed in support of drilling-related activities. Along with the permit application, the OC considered information submitted during the public comment period.

Denbury has completed or committed to completing the following activities in order to avoid potential and real adverse environmental impacts:

A. Protection of the USDW by proposing to set surface casing in a shale at least 100 feet below the lowermost USDW and cementing that casing to surface in accordance with IMD standards;
B. Ensuring injectivity testing will not result in movement of fluids into the USDW by cementing the intermediate and long string casings to surface;
C. Evaluating any wellbores within a ¼ radius area of review to ensure that injectivity testing will not cause fluids to migrate to the USDW;
D. Confirming cement isolation by running a cement bond log on all casing strings;
E. Filing a stormwater pollution prevention plan and a Notice of Intent for coverage under the Storm Water General Permit for Large Construction Activities with the Louisiana Department of Environmental Quality (LDEQ) in order to mitigate storm water runoff pollution;
F. Implementing a closed loop drilling operation to contain all drilling fluids, drilling mud, and drill cuttings, which are to be disposed of at an approved offsite facility;
G. Utilizing the United States Fish and Wildlife Service (USFWS) Information Planning and Consultation Tool to help identify the presence of any known, threatened, or endangered species potentially in the area.

CONCLUSION: For the foregoing reasons, the OC finds that Denbury has avoided, to the maximum extent possible, the potential and real adverse environmental impacts associated with this permit application.

IV. ALTERNATIVE PROJECTS: Are there alternative projects which would offer more protection to the environment than the proposed facility site without unduly curtailing non-environmental benefits?

The project was planned in order to evaluate the feasibility of developing a carbon capture and sequestration program in southeast Vernon Parish. Since site-specific information is not currently

available, the collection of site-specific data, such as cores, fluid samples, static pressure measurements, and other information, are necessary for full assessment of a potential geologic sequestration project and cannot be acquired through other means except direct testing of subsurface formations via drilling.

Since the stated intent of the proposed well is to assess the suitability of formations of interest located in the subsurface for geologic sequestration, the whole purpose of the stratigraphic test well would be compromised if it were sited away from the southeastern portion of Vernon Parish.

CONCLUSION: For the foregoing reasons, the OC finds that there are no alternative projects which would offer more protection to the environment than the proposed facility site without unduly curtailing non-environmental benefits.

V. ALTERNATIVE SITES: Are there alternative sites which would offer more protection to the environment than the proposed facility site without unduly curtailing non-environmental benefits?

The site location was selected in order to provide the necessary subsurface information needed to evaluate the feasibility of developing a carbon capture and sequestration program in southeast Vernon Parish. Other locations in the area were not selected due to potential impacts to wetlands.

Additionally, the site location was chosen based on reservoir model results indicating that the location is an optimal point for future use as a potential monitoring well. By strategically placing stratigraphic test wells where they can be later used as monitor wells, Denbury will minimize the amount of additional wells to support a future sequestration project. Limiting the numbers of wells needing to be drilled will minimize the impacts to the public and the environment.

CONCLUSION: For the foregoing reasons, the OC finds that there are no alternative sites which would offer more protection to the environment than the proposed facility site without unduly curtailing non-environmental benefits.

VI. MITIGATING MEASURES: Are there mitigating measures which offer more protection to the environment, than the facility as proposed, without unduly curtailing non-environmental benefits?

Potential and real adverse environmental effects were considered both in regard to the construction of the well itself and with respect to construction activities to be completed in support of drilling-related activities. Along with the permit application, the OC considered information submitted during the public comment period.

Denbury has completed or committed to completing the following mitigating measures:

A. Protection of the USDW by proposing to set surface casing in a shale at least 100 feet below the lowermost USDW and cementing that casing to surface in accordance with IMD standards;

B. Ensuring injectivity testing will not result in movement of fluids into the USDW by cementing the intermediate and long string casings to surface;
C. Evaluating any wellbores within a ¼ radius area of review to ensure that injectivity testing will not cause fluids to migrate to the USDW;
D. Confirming cement isolation by running a cement bond log on all casing strings.
E. Filing a stormwater pollution prevention plan and a Notice of Intent for coverage under the Storm Water General Permit for Large Construction Activities with the LDEQ in order to mitigate storm water runoff pollution;
F. Implement a closed loop drilling operation to contain all drilling fluids, drilling mud, and drill cuttings, which are to be disposed of at an approved offsite facility;
G. Utilizing the USFWS Information Planning and Consultation Tool to help identify the presence of any known, threatened, or endangered species potentially in the area.

CONCLUSION: For the foregoing reasons, the OC finds that there are no mitigating measures which offer more protection to the environment, than the facility as proposed, without unduly curtailing non-environmental benefits.

VII. COST-BENEFIT ANALYSIS (BALANCING): Does a cost-benefit analysis of the environmental impact costs balanced against the social and economic benefits of the proposed facility demonstrate that the later outweighs the former?

Environmental impact costs associated with this permit application include the following:

A. Potential endangerment of the USDW. Denbury will take set surface casing at least 100 feet below USDW and cement to surface. Cement bond to the casing will be verified by the use of a cement bond log. Denbury will add an additional layer of protection to the USDW by setting an intermediate string of casing and cementing back to surface. This will be verified with a cement bond log.
B. Potential pollution from drilling activities. Denbury will minimize pollution by utilizing a closed loop drilling system and will dispose of all waste at an appropriate disposal facility. Denbury will obtain required permits from LDEQ if they are deemed a generator or transporter of such waste.

The fundamental purpose and benefit of the proposed project is the collection of the geologic data needed to evaluate fully the feasibility of potential geologic sequestration at this location. The proposed well is not presently permitted for the disposal of waste via injection.

Preliminary geologic assessments have already been conducted by Denbury using existing publicly available data. Nevertheless, site-specific information is not currently available. The collection of site-specific data, such as cores, fluid samples, static pressure measurements, and other information, are necessary for full assessment of a potential geologic sequestration project and cannot be acquired through other means except direct testing of subsurface formations via drilling.

CONCLUSION: For the foregoing reasons, the OC finds that the social and economic benefits of the collection of this data via the drilling of the proposed well outweigh its environmental impact costs.

VIII. CONCLUSION

The OC has conducted a review of the entire administrative record, including the permit application and other information submitted by Denbury. Based on its review of the entire record as a whole and for all of the foregoing reasons, the OC concludes that the application satisfies the requirements of the public trust doctrine of the State of Louisiana as articulated by *Save Ourselves, Inc. v. La. Env't Control Cmm'n*, 452 So. 2d 1152 (La. 1984) as well as applicable statutes and regulations. Accordingly, the OC shall issue the permit for the above-referenced application to Denbury for the drilling of a Class V stratigraphic test well.

MONIQUE M. EDWARDS
COMMISSIONER OF CONSERVATION

Response to Public Comments

for

Denbury Low Carbon Solutions, LLC (D10126)
Draco IZM Well No. 001
Application No. 44308

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Public notice of the hearing was given on October 31, 2023, in *The Advocate*, the official state journal; on November 3, 2023, in *The News Leader*, the official parish journal of Vernon Parish; on November 2, 2023, by forwarding a copy of the public notice to the Vernon Parish President and to interested parties. Any person may request a copy of the list of interested parties by e-mailing injection-mining@la.gov.

OC held a public hearing on December 7, 2023, at the reception hall of the Leesville Municipal Golf Course in Leesville, Louisiana. At the hearing, OC afforded all interested parties the opportunity to present oral or written comments on the proposed permit action. The public comment period began on November 3, 2023, and ended on December 8, 2023.

IMD received one written comment and two oral comments during the public comment period. After reviewing and considering all comments received during the public hearing, the Commissioner of Conservation has grouped comments together based on topical similarity and responded to the relevant comments as follows:

COMMENT:

A comment stated that the public did not have proper notice of the draft permit and the details of the public hearing.

RESPONSE:

Per the requirements detailed in LAC 43:XVII.111.E.1, public notice of the public hearing was given on October 31, 2023, in *The Advocate*, the official state journal, and on November 3, 2023, in *The News Leader*, the official parish journal of Vernon Parish. This public notice included the date, time, location, and subject matter of the public hearing and indicated how

members of the public could obtain copies of the draft permit. The public notice included instructions to contact Patrick Ragan at IMD to obtain a copy or ask questions. The draft permit was publically available at IMD's office in Baton Rouge, Louisiana as well as on IMD's and OC's websites. The public hearing was held on December 7, 2023; therefore, the public was given notice more than thirty days prior to the date of the public hearing in accordance with LAC 43:XVII.11.E.2.

COMMENT:

A comment indicated opposition to the draft permit due to concerns pertaining to the permitting of Class VI carbon dioxide geologic sequestration wells and possible effects on landowners' future rights to explore for and produce oil and gas.

RESPONSE:

This matter is currently under the authority of a federal agency and is, therefore, outside OC's jurisdiction. As such, OC does not consider this comment relevant to OC's decision regarding this permit application. The final permitting decision will be based on the application's conformance with all statutes pertaining to OC's regulatory authority; the rules and regulations for Class V wells found in Statewide Order No. 29-N-1 (LAC 43:XVII, Subpart 1); the protection of underground sources of drinking water; and the health, safety, and welfare of the public.

OC does not consider comments pertaining to the permitting of Class VI injection wells relevant to its decision regarding this permit application. The proposed well is not presently permitted to be used for the injection of carbon dioxide or for waste disposal. The United States Environmental Protection Agency (EPA) currently holds primary enforcement authority (primacy) for Class VI injection wells. Please contact Region 6 of the EPA with any questions related to the permitting or operations of Class VI injection wells.

COMMENT:

A comment stated that the location of the proposed well was not available to the public.

RESPONSE:

The exact coordinates for the proposed injection well were provided multiple times throughout the draft permit publically available at IMD's office in Baton Rouge, Louisiana and on IMD's and OC's websites. For example, the draft permit included the exact coordinates in a surveyor-certified location plat, which IMD reviewed and found to be in conformity with the requirements detailed in Policy No. IMD-GS-10. The public notice of the public hearing advertised in *The Advocate* and *The News Leader* also included section, township, and range information for the proposed well's location.