Environmental Assessment for the Wabash Valley Resources, LLC – Wabash Hydrogen Energy Center Project

Department of Energy Loan Program Office
Innovative Energy Loan Guarantee Program

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ACRONYMS AND ABBREVIATIONS

Acronymn	Definition
AASHTO	American Association of State Highway and Transportation Officials
AJD	approved jurisdictional determination
ANSI	American National Standards Institute
APE	area of potential effects
API	American Petroleum Institute
ASME	American Society for Mechanical Engineers
ASTs	above ground storage tanks
ASU	air separation unit
BACT	best available control technology
BMPs	best management practices
CCR	Coal Combustion Residuals
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIF	construction in floodway
CM	confining-layer monitoring
CMStP&P	Chicago, Milwaukee, St. Paul and Pacific
CO	carbon monoxide
CO2	carbon dioxide
CO2e	carbon dioxide equivalents
CRA	Cultural Resources Analyst, Inc.
dB	decibels
dBA	A-weighted decibels
DHPA	Division of Historic Preservation and Archaeology
DOE	U.S. Department of Energy
EA	Environmental Assessment
EAP	emergency action plan
EIR	Energy Infrastructure Reinvestment
EPA	U.S. Environmental Protection Agency
EPAct	Energy Policy Act of 2005
ESAL	equivalent single axle load
FEMA's	Federal Emergency Management Agency's
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
GHG	greenhouse gases
gpm	gallons per minute
H2	hydrogen
HRI	Healthy Rivers Initiative
IDEM	Indiana Department of Environmental Management
IDNR	Department of Natural Resources
ISGS	Illinois State Geological Survey
JHA	job hazard analysis
Ldn	day-night sound level
LOD	limit-of-disturbance

Acronymn	Definition
LOS	level of service
mgd	million gallons per day
MOVES5	Motor Vehicle Emission Simulator
NAAQS	National Ambient Air Quality Standards
NFPA	National Fire Protection Association
NH3	anhydrous ammonia
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act of 1966
NLCD	National Land Cover Database
NO2	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OLDCC	Office of Local Defense Community Cooperation
OLQ	Office of Land Quality
OPPTA	OLQ Office of Pollution & Prevention Technology
OSHA	Occupational Safety and Health Administration
Pb	lead
PEM	palustrine emergent
PFO	palustrine forested
PHA	process hazard analysis
PJD	preliminary jurisdictional determination
PM	particulate matter
PM2.5	particulate matter 2.5 microns or less in diameter
PNNL	Pacific Northwest National Lab
PPE	personal protective equipment
ppm	parts per million
Project	Wabash Hydrogen Energy Center Project
PSA	pressure swing adsorption
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PSM	Process Safety Management
PSS	palustrine scrub shrub
RCRA	Resource Conservation and Recovery Act
RMP	Risk Management Plan
RV	recreational vehicle
SCFD	Sugar Creek Fire Department
SCFD	Sugar Creek Fire Department
SDS	Safety Data Sheet
SDWA	Safe Drinking Water Act
SHAARD	State Historic Architectural and Archaeological Research Database
SHPO	State Historic Preservation Office
SO2	sulfur dioxide
SSURGO	Soil Survey Geographic Database

Acronymn	Definition
STI	Steel Tank Institute
SWPPP	Stormwater Pollution Prevention Plan
SWWFs	significant water withdrawal facilities
TCLP	Toxicity Characteristic Leaching Procedure
TNM	Traffic Noise Model
U.S.C.	United States Code
UIC	underground injection control
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency

1. PURPOSE AND NEED

1.1 Introduction

Wabash Valley Resources, LLC (WVR), is proposing to develop a commercial-scale waste-to-ammonia production facility that will use carbon capture and storage technology. WVR will repurpose the site of a former coal gasification facility and construct the Wabash Ammonia Production Facility (Wabash Facility) in West Terre Haute, Indiana. Two carbon dioxide (CO_2) injection well facilities and four associated monitoring wells will be constructed at nearby sites in Vigo and Vermillion Counties. Development and operation of these locations collectively constitutes the proposed Wabash Hydrogen Energy Center Project (Project).

WVR has applied for a loan guarantee pursuant to the U.S. Department of Energy (DOE) Title XVII Clean Energy Financing Program, as authorized by the Energy Policy Act of 2005 (EPAct), as amended (42 United States Code [U.S.C.] 16501–16517). Under Title XVII, the Secretary of Energy is authorized to provide loan guarantees for projects that support clean energy deployment and energy infrastructure reinvestment in the United States.

The Title XVII Program is administered by DOE's Loan Programs Office (LPO). LPO originates, underwrites, and services loans and loan guarantees to eligible applicants for projects that accelerate the commercial deployment of innovative energy technology. LPO has reviewed the application and determined that WVR is eligible for a potential loan guarantee (10 Code of Federal Regulations [CFR] CFR Parts 609.3 and 609.5).

The decision as to whether to provide a loan guarantee (federal financial assistance) constitutes a major federal action, which requires DOE to conduct an environmental review under the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321–4347). DOE LPO is aware that the Council on Environmental Quality (CEQ) issued an interim final rule that removed the council's NEPA implementing regulations. In accordance with a CEQ memorandum to the heads of federal departments and agencies, issued on February 19, 2025, and Executive Order 14154, issued on January 20, 2025, DOE LPO has prepared this EA, which is in compliance with DOE's existing NEPA implementing regulations (10 CFR Part 1021) and consistent with NEPA, Executive Order 14154, and the CEQ memorandum. LPO is using the NEPA process to inform its decision as to whether to issue a loan guarantee to WVR in support of the Project.

1.2 Purpose and Need for Agency Action

The purpose and need for DOE's proposed action, issuance of a federal loan guarantee, support DOE's authority under Title XVII of the EPAct, which was reauthorized, amended, and revised by the Inflation Reduction Act of 2022 to create the Energy Infrastructure Reinvestment (EIR) Program (Section 1706). The purpose of the EIR Program is to finance projects and facilities in the United States that retool, repower, repurpose, or replace energy infrastructure that has ceased operation or enable operating energy infrastructure to avoid, reduce, use, or sequester air pollutants or anthropogenic emissions of greenhouse gases (GHGs) (42 U.S.C. 16517[a][2]).

1.3 Background

WVR is a chemical manufacturer that focuses on sustainable agriculture. The company's net-zero, carbon-capable processes would produce clean hydrogen gas and anhydrous ammonia fertilizer, with petroleum coke and coal being the primary feedstocks. WVR's objective is to

develop a first-to-market, large-scale sustainable supply of domestic fertilizer in the Corn Belt to reduce the dependency of the U.S. on imports and lower costs for farmers.

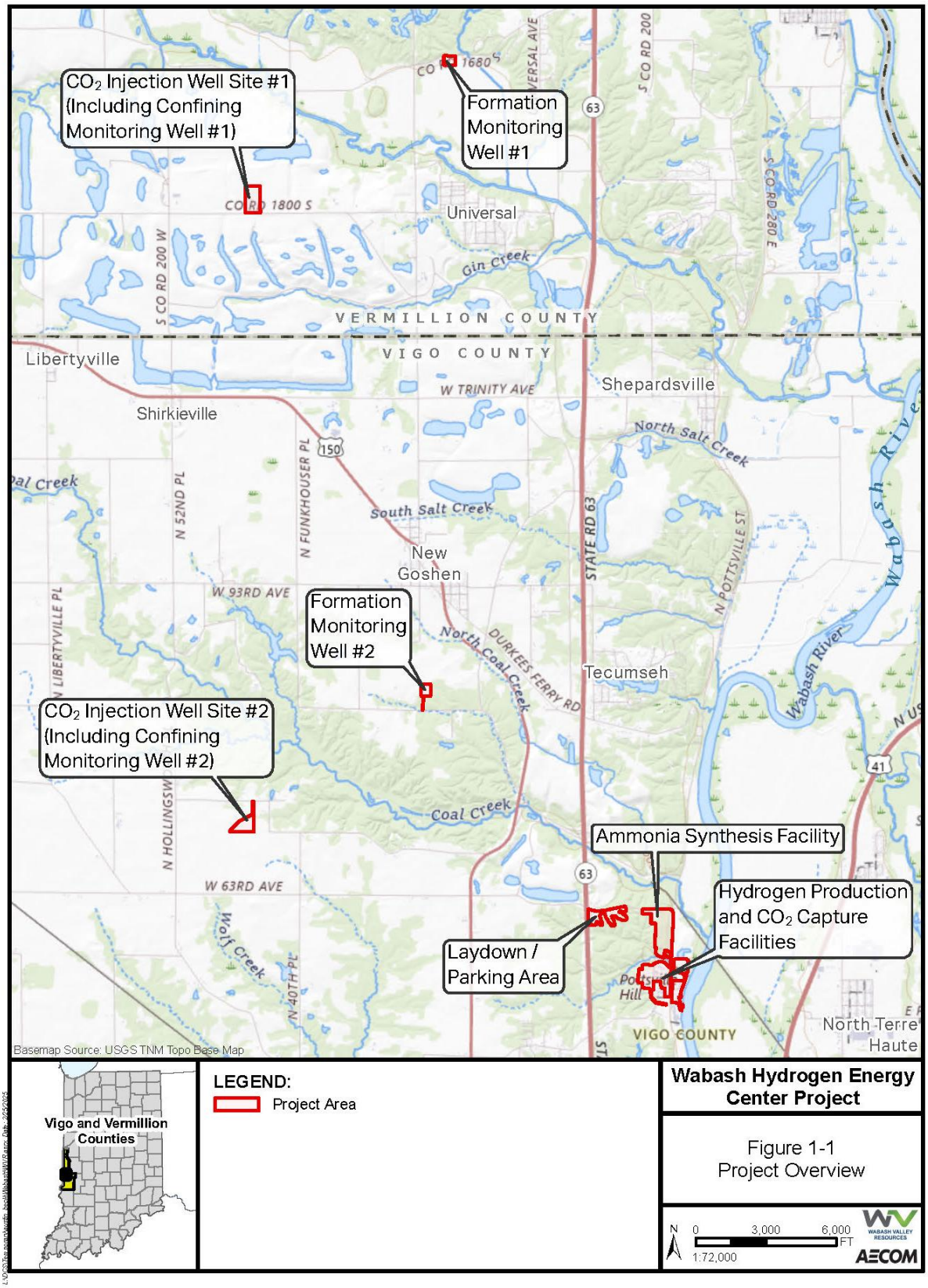
WVR proposes repurposing the former site of the Wabash River Coal Gasification Repowering Demonstration Project (WRCGRDP) at 444 West Sandford Avenue in West Terre Haute. Converting the coal gasification plant to the proposed Wabash Facility will involve refurbishing an existing industrial gasifier and installing the new equipment required to separate CO_2 and produce high-purity hydrogen (i.e., the hydrogen production and CO_2 capture facilities). Existing plant assets will be employed to the maximum extent practicable. WVR proposes constructing the Project's new ammonia production plant (i.e., the ammonia synthesis facility) and laydown yard/parking area north of the existing WRCGRDP footprint, thereby expanding the overall developed area at this location. The Ammonia Synthesis facility will produce anhydrous ammonia, which will be sold and trucked off-site. The Wabash Facility will be designed for the annual production of 500,000 metric tonnes of anhydrous ammonia. It will operate 300 days a year and capture 5,500 metric tonnes of CO_2 per day.

In addition to the Wabash Facility, WVR proposes constructing two off-site CO_2 injection facilities, each with a CO_2 injection well, a co-located confining-layer monitoring (CM) well, and an off-site formation monitoring (FM) well. CO_2 will be transported by a truck with a hydrogen fuel cell to the injection facilities at a rate of approximately 1.67 million metric tonnes annually for permanent storage in the deep saline reservoirs of the Illinois Basin, which have already demonstrated suitability. WVR proposes constructing injection well Site #1 (Injection Well Permit WVCCS#1/CM1) approximately 7 miles northwest of the Wabash Facility in Vermillion County and injection well Site #2 (Injection Well Permit WVCCS#2/CM2) approximately 3 miles west of the Wabash Facility in Vigo County. An FM well will be drilled approximately 1.75 miles away from each injection well site in Vermillion and Vigo Counties (FM1 and FM2, respectively) (see **Figure 1, Project Overview**).

The Project will support goals that aim to reduce foreign imports of nitrogen fertilizers and decarbonize their production. To achieve decarbonization, the Project will employ carbon capture and sequestration technology to produce anhydrous ammonia. Furthermore, the Project site is on former coal mines and next to a decommissioned coal-fired power plant. Therefore, the Project will support revitalization of a former coal community.

The EIR Program is central to LPO's mission to serve as a "bridge to bankability" for clean energy projects that are critical to decarbonizing the energy sector. With the EIR Program, LPO can support projects that reinvest in energy infrastructure throughout the United States. This includes upgrading or uprating energy infrastructure so it can restart or operate more efficiently, at higher output, and with lower emissions. It also involves replacing retired energy infrastructure with clean energy infrastructure and building new facilities for clean energy purposes that use legacy energy infrastructure.

Figure 1-1: Project Overview



1.4 Scope of Environmental Assessment

LPO is preparing this Environmental Assessment (EA) to address the deployment of the Wabash Hydrogen Energy Center Project. If no significant impacts are identified during preparation of this EA, DOE will issue a Finding of No Significant Impact. If potentially significant impacts are identified, DOE will prepare an environmental impact statement. As presented below, natural, physical, and socioeconomic resources that may be subject to potentially significant environmental issues are identified, as are resources that would not be subject to potentially significant environmental issues, thereby narrowing the scope of the environmental review to only those environmental issues deserving of study.

The first phase of the Project would be to develop the Wabash Facility and drill the CO_2 injection wells and associated monitoring wells. The second phase would be operation of the Project facilities after modifications and construction activities have occurred. Construction and operations at all Project locations are part of this review.

WVR has identified the necessary federal, state, and local permits and approvals needed to construct and operate the Project facilities. A list of applicable permits and approval, along with copies of those obtained to date, is provided in Appendix A.

This EA describes the Project and its potential impacts on multiple resource areas due to development of the Wabash Facility, including the repurposed industrial gasifier and refurbished WRCGRDP facility, the hydrogen production and CO_2 capture facilities, the ammonia synthesis facility, and the laydown yard/parking area. Development of the two CO_2 injection wells (WVCCS#1/CM1 and WVCCS#2/CM2) and the two FM wells (FM1 and FM1) is also considered in this analysis, as are the selected routes for transport of CO_2 from the Wabash Facility to the injection sites.

The resource areas assessed in this EA consist of:

- Cultural resources, including Native American interests
- Water resources, including groundwater, surface water, wetlands, and floodplains
- Air quality
- Noise
- Traffic and transportation
- Aesthetic and visual resources
- Biological resources
- Socioeconomics
- Health and safety
- Waste management
- Soils and prime farmlands
- Land use and recreation

These resource areas were identified as being potentially affected by the Project; therefore, each was assessed to determine the nature, extent, and significance of the impacts (see Section 3). The assessment combined desktop research and analysis of existing available information with select field studies, including site assessments related to the presence/absence

of wetlands, water bodies, cultural resources, and sensitive receptors. LPO has determined that the geological studies required by the U.S. Environmental Protection Agency (EPA) Class VI injection well permit will be sufficient and that a separate assessment will not be required.

2. DESCRIPTION OF THE PROPOSED ACTION

2.1 DOE's Proposed Action

The Proposed Action consists of federal financial support in the form of a loan guarantee, pursuant to the Title XVII Clean Energy Financing Program, for development of the Wabash Facility, two CO_2 injection well sites, and two FM wells (i.e., the Project). As proposed by the applicant, WVR, the Wabash Facility will have a refurbished gasification plant, hydrogen production and carbon capture facilities, an ammonia synthesis facility, and various pieces of support infrastructure, including CO_2 and ammonia storage and transport facilities, a hydrogen fueling facility, laydown yards/parking areas, a petroleum coke (petcoke) and coal storage area and conveyor system, and raw water intake and treatment systems. WVR will construct the Wabash Facility at the location of the former WRCGRDP, which was part of the Clean Coal Technology Demonstration Program sponsored by DOE from 1995 to 2000. In addition to the Wabash Facility, six wells will be drilled as part of the Project. Each of the two CO_2 injection well sites will have a CO_2 injection well; a collocated CM well; associated CO_2 offloading, storage, and injection infrastructure; and CO_2 transport trucks. An FM well will be approximately 1.75 miles from each CO_2 injection well site.

2.2 Description of the Project

WVR proposes constructing the Wabash Facility at the former WRCGRDP location at 444 West Sandford Avenue in West Terre Haute. The two CO_2 injection well sites and two FM wells will be constructed at four designated locations in Vigo and Vermillion Counties. CO_2 injection well Site #1 (Injection Well Permit WVCCS#1/CM1) will be approximately 7 miles northwest of the former WRCGRDP facility in Vermillion County. CO_2 injection well Site #2 (Injection Well Permit WVCCS#2/CM2) will be approximately 3 miles west of the former WRCGRDP facility in Vigo County. The two nearby FM wells will be developed in conjunction with each CO_2 injection well site, with one FM well in Vermillion County (FM1) and one in Vigo County (FM2). See **Figure 2-1** for an overview of the locations for each Project component.

The WRCGRDP was an integrated gasification, combined-cycle steam power project that combined coal and petcoke gasification with gas turbine and steam power generation. The WRCGRDP operated for 3 years, after which the site was operated as a commercial gasification facility that produced synthetic gas (syngas) and steam for the adjacent gas turbine and steam power generation facilities. Commercial operations ceased in 2016, but the infrastructure and various facilities have been maintained. The existing combustion turbine is not owned or operated by WVR or any of its subsidiaries.

Under the Project, WVR will refurbish existing gasification equipment within the WRCGRDP site (i.e., gasification facility). The existing air separation unit (ASU) will be modified to produce both oxygen and nitrogen (**Figure 2-1A**). Refurbishment of the gasification equipment will involve rebuilding pumps and motors, refurbishing valves, and recoating tanks (Section 2.3.1). Modification of the ASU will involve the addition of a secondary nitrogen purification column and the installation of a new compressor (Section 2.3.1).

Additional facilities will be developed within the existing WRCGRDP site to convert the syngas produced by the refurbished gasification facility into purified hydrogen and CO_2 (i.e., hydrogen production and CO_2 capture facilities) (see **Figure 2-1A**). A new facility will be constructed to produce ammonia from the hydrogen and nitrogen (ammonia synthesis facility) (see **Figure 2-1B**). CO_2 and ammonia storage and loading/shipping infrastructure as well as a hydrogen fueling facility will be included as part of the facilities. Non-contiguous laydown yards/parking areas will be constructed and used as part of the Project (**Figure 2-1C**).

Figure 2-1: Project Site Location Map

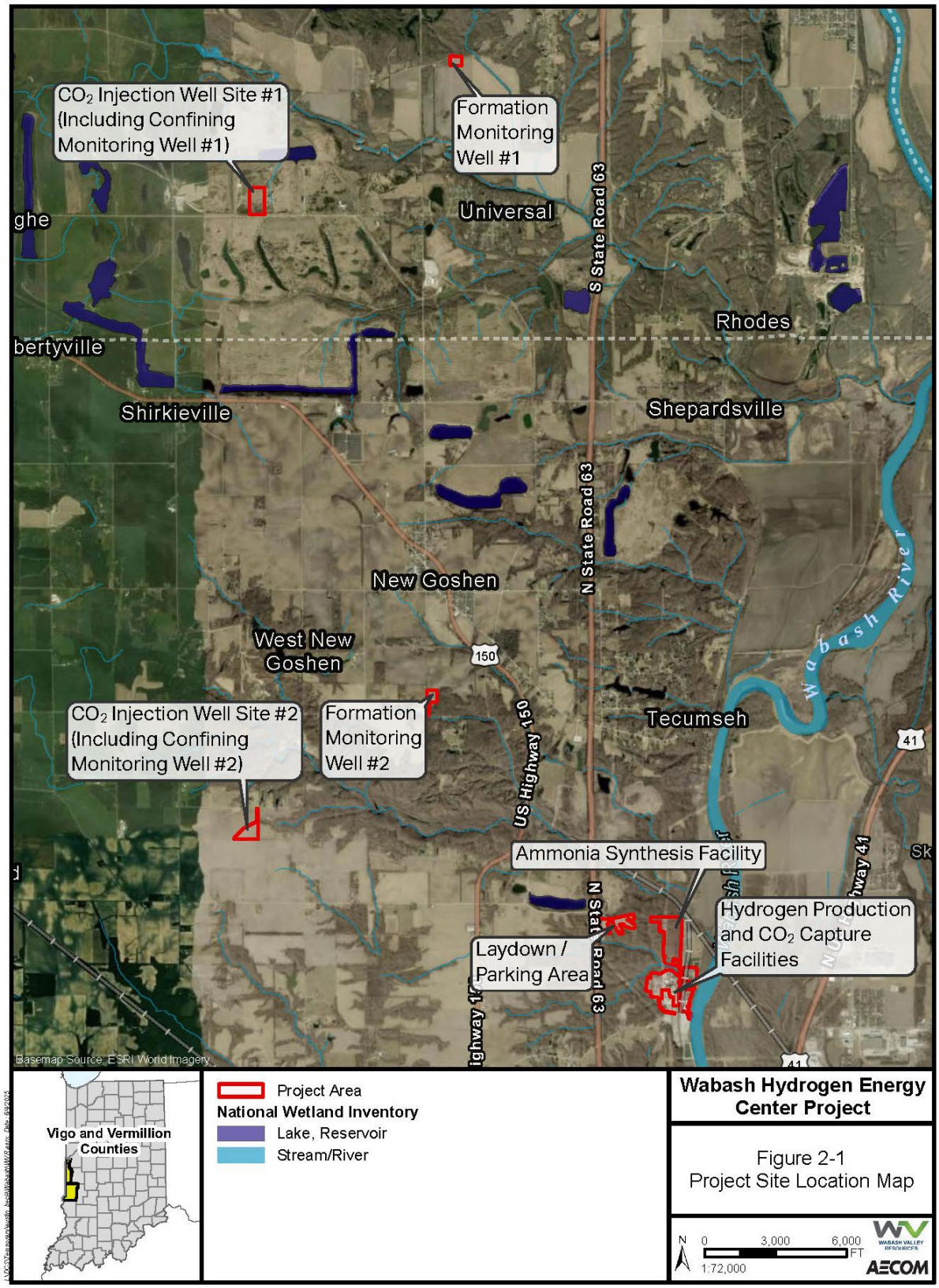


Figure 2-1A: Hydrogen Production and CO_2 Capture Facilities

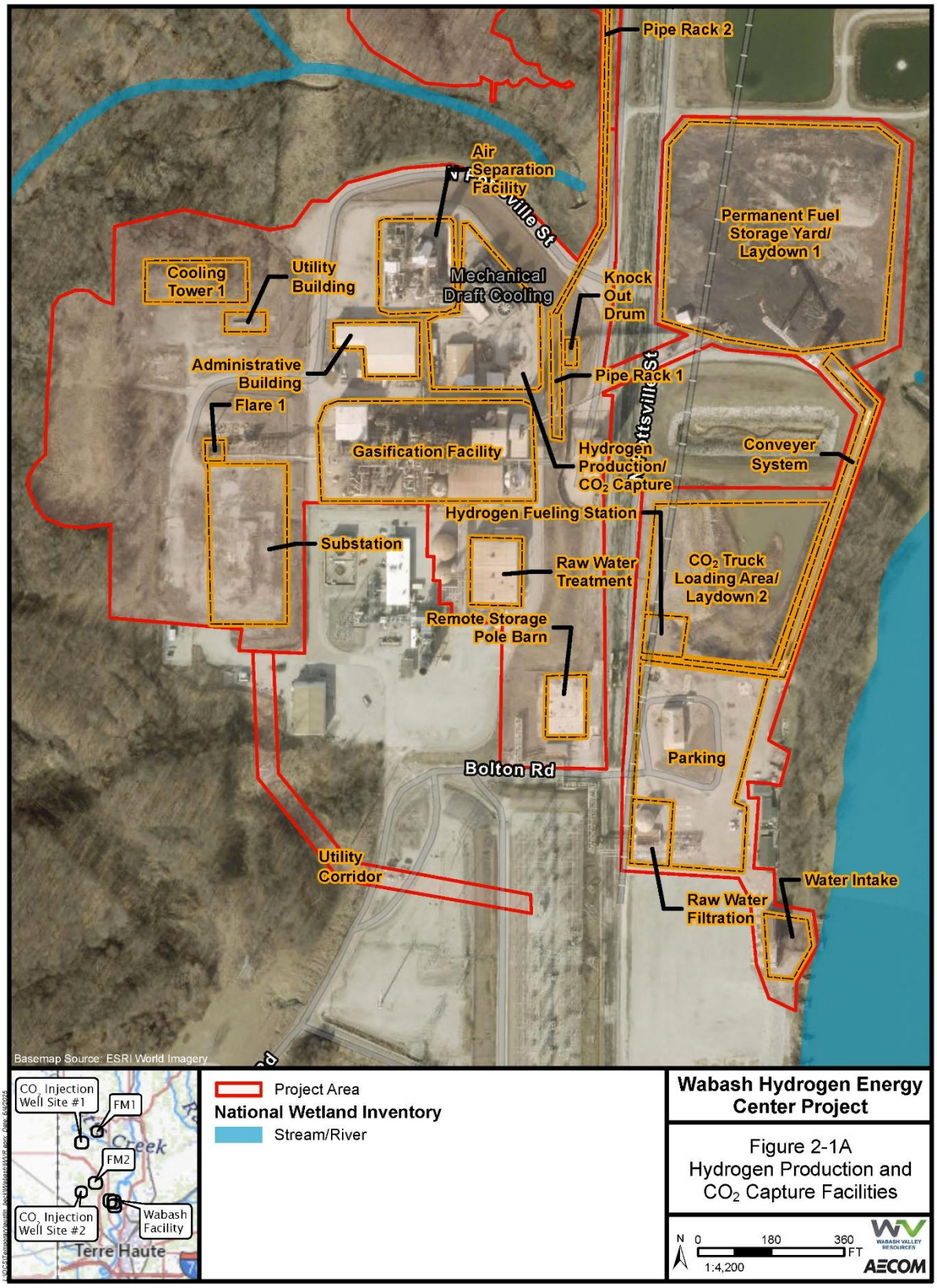


Figure 2-1B: Ammonia Synthesis Facility

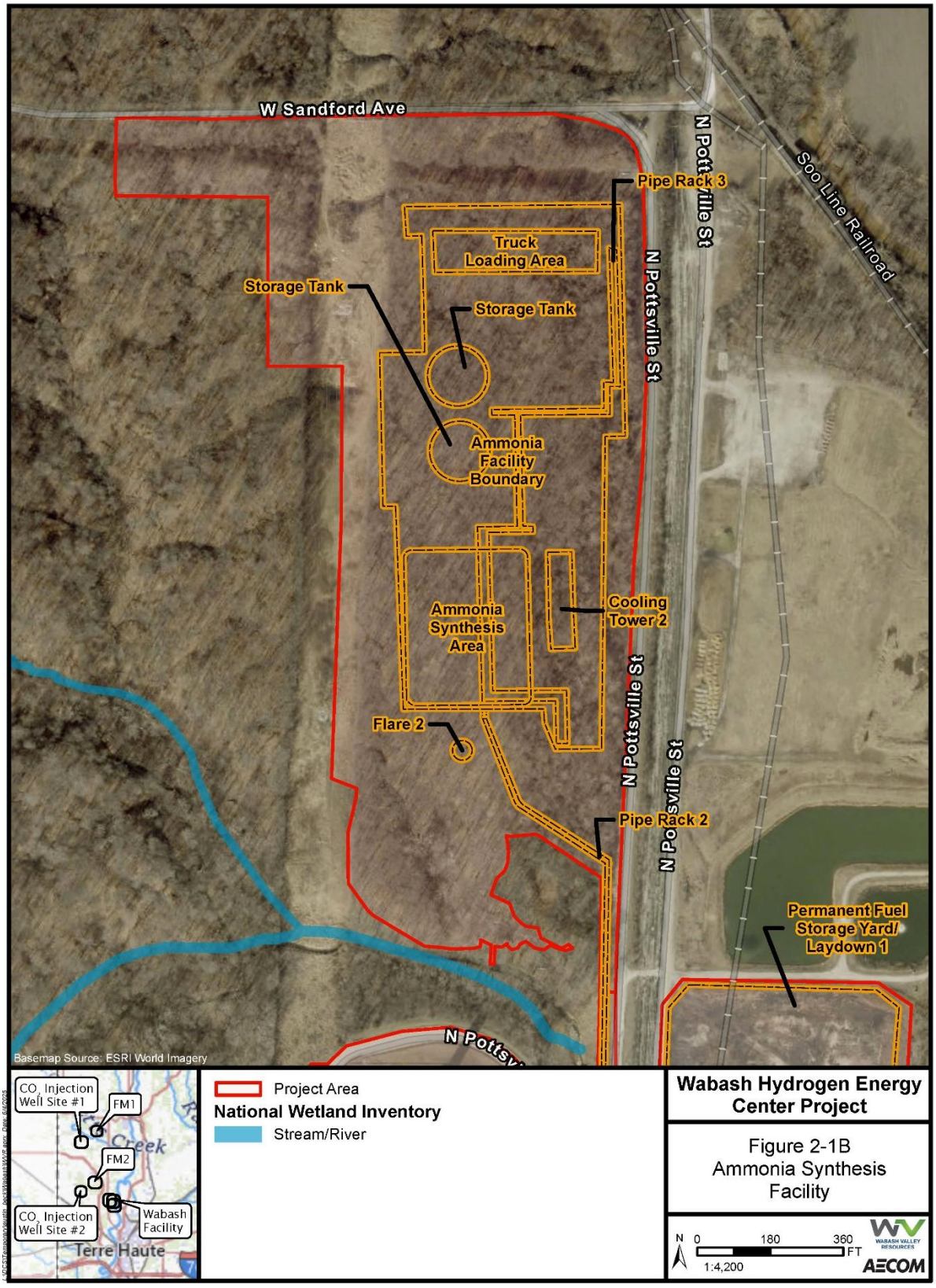


Figure 2-1C: Laydown/Parking Area

The Wabash Facility's gasification process will use the following equipment from the WRCGRDP: the former coal feedstock storage area infrastructure and handling systems (conveyors); raw water treatment system; the E-Gas technology gasification unit; the ASU, modified to produce both oxygen and nitrogen; the syngas cooling and treatment facility; the sour water treatment system; the sulfur removal unit; the sulfur recovery unit; and the steam boiler (**Figure 2-1A**). New equipment associated with the hydrogen production and CO_2 capture facilities will include a water-gas shift unit; a syngas dehydration unit; a CO_2 fractionation unit, along with associated compressors and storage tanks; and a pressure-swing adsorption unit to purify the hydrogen required for ammonia synthesis (**Figure 2-1A**). The new ammonia synthesis facility will include refrigerated product storage and truck loadout infrastructure (**Figure 2-1B**).

WVR proposes transporting the CO_2 produced at the Wabash Facility to the injection well sites in CO_2 tanker trucks. Specifically, WVR will use electric trucks with hydrogen fuel cells to transport of the CO_2 and construct a hydrogen fueling station at the Wabash Facility to re-fuel the vehicles. As a producer of high-purity hydrogen, WVR will use the hydrogen produced on-site to fuel the trucks. The hydrogen fueling station will be next to the CO_2 loading area at the hydrogen production and CO_2 capture facilities, which are in the footprint of the former WRCGRDP site (see **Figure 2-1A**). With a constantly available hydrogen stream, the Project will require minimal hydrogen storage and will not be configured to receive shipments of liquid or bulk high-pressure hydrogen.

The selection of trucking routes considered route length, road quality, and traffic impacts and avoided low-capacity bridges, as shown in **Figure 2-2** and detailed below. The route to CO_2 injection well Site #1 (WVCCS#1/CM1) is approximately 28 miles long; the route from the CO_2 storage and loading facility to WVCCS#1/CM1 is approximately 19 miles long, with a return route of 9 miles. The route to CO_2 injection well Site #2 (WVCCS#2/CM2) is approximately 9.3 miles long; the route from the CO_2 storage and loading facility to WVCCS#2/CM2 is approximately 4.1 miles long, with a return route of approximately 5.3 miles.

Route to and from CO_2 Injection Well Site #1

1. From Wabash Facility, West Sandford Avenue (west 0.5 miles)
2. North 1 intersection (West Sandford Road and State Road 63) right turn
3. State Road 63 (north 8.2 miles) (leave Vigo County, enter Vermillion County)
4. North 2 intersection (State Road 163 and State Road 63) left turn
5. State Highway 163 (west 5.4 miles)
6. North 3 intersection (State Line Road and State Road 163) left turn
7. State Line Road (south 1.5 miles)
8. North 4 intersection (State Line Road and Brouilletts Road) left turn
9. Brouilletts Road (east 1.2 miles)
10. North 5 intersection (Brouilletts Road and County Road 250 West) right turn
11. County Road 250 West (south 1.6 miles)
12. North 6 intersection (County Road 250 West and County Road 1800 South) left turn
13. County Road 1800 South (east 0.5 mile) to haul destination (CO_2 injection well Site #1)
14. From haul destination, County Road 1800 South (east 1.5 miles)
15. North 7 intersection (County Road 1800 South and Rangeline Road) right turn

16. Rangeline Road (south 1.5 miles) (leave Vermillion County, enter Vigo County)
17. North 8 intersection (Rangeline Road and Trinity Avenue) left turn
18. Trinity Avenue (east 1.4 miles)
19. North 9 intersection (Trinity Avenue and State Road 63) right turn
20. State Road 63 (south 4.1 miles)
21. North 10 intersection (State Road 63 and West Sandford Avenue) left turn
22. West Sandford Avenue (east 0.5 mile) to Wabash Facility

Route to and from CO_2 Injection Well Site #2

1. From Wabash Facility, West Sandford Avenue (west 2.9 miles)
2. South 1 intersection (West Sandford Avenue and Regan Road) right turn
3. Regan Road (north 0.5 mile)
4. South 2 intersection (Regan Road and Dugger Avenue) left turn
5. Dugger Road (west 0.25 mile)
6. South 3 intersection (Dugger Avenue and Reiter Road) right turn
7. Reiter Road (north 0.25 mile)
8. South 4 intersection (Reiter Road and Wright Avenue) left turn
9. Wright Avenue (west 0.2 mile) to haul destination (CO_2 injection well Site #2)
10. From haul destination, Wright Avenue (west 0.6 mile)
11. South 5 intersection (Wright Avenue and Hollingsworth Place) left turn
12. Hollingsworth Place (south 0.75 mile)
13. South 6 intersection (Hollingsworth Place and West Sandford Avenue) left turn
14. West Sandford Avenue (3.85 miles east) to Wabash Facility

The subsections below discuss the construction (Section 2.3) and operations (Section 2.4) associated with the primary Project locations and elements, as listed below.

- **Wabash Facility**
  - Hydrogen production and CO_2 capture facilities (**Figure 2-1A**)
    - Refurbishment of facilities and units associated with the former WRCGRDP site, including modification of the ASU to produce nitrogen and oxygen (gasification facility)
    - CO_2 storage and loading facility, including the hydrogen fueling station
    - Railyard and rail spur refurbishment
  - Ammonia synthesis facility, including refrigerated ammonia storage tanks and truck loadout area (**Figure 2-1B**)
  - Construction laydown yards/parking areas (**Figure 2-1C**)

- **CO_2 Injection Well Sites #1 and #2 (Figure 2-1D and Figure 2-1F)**
  - CO_2 injection well, CO_2 storage/injection system, and CO_2 offloading facility Site 1 (WVCCS#1) (Vermillion County)
  - CO_2 injection well, CO_2 storage/injection system, and CO_2 offloading facility Site 2 (WVCCS#2) (Vigo County)
  - CO_2 CM wells adjacent to the CO_2 injection wells (CM1 and CM2)
- **Formation Monitoring Wells #1 and #2 (Figure 2-1E and Figure 2-1G)**
  - FM1 (Vermillion County)
  - FM2 (Vigo County)

Figure 2-1D: CO_2 Injection Well Site #1

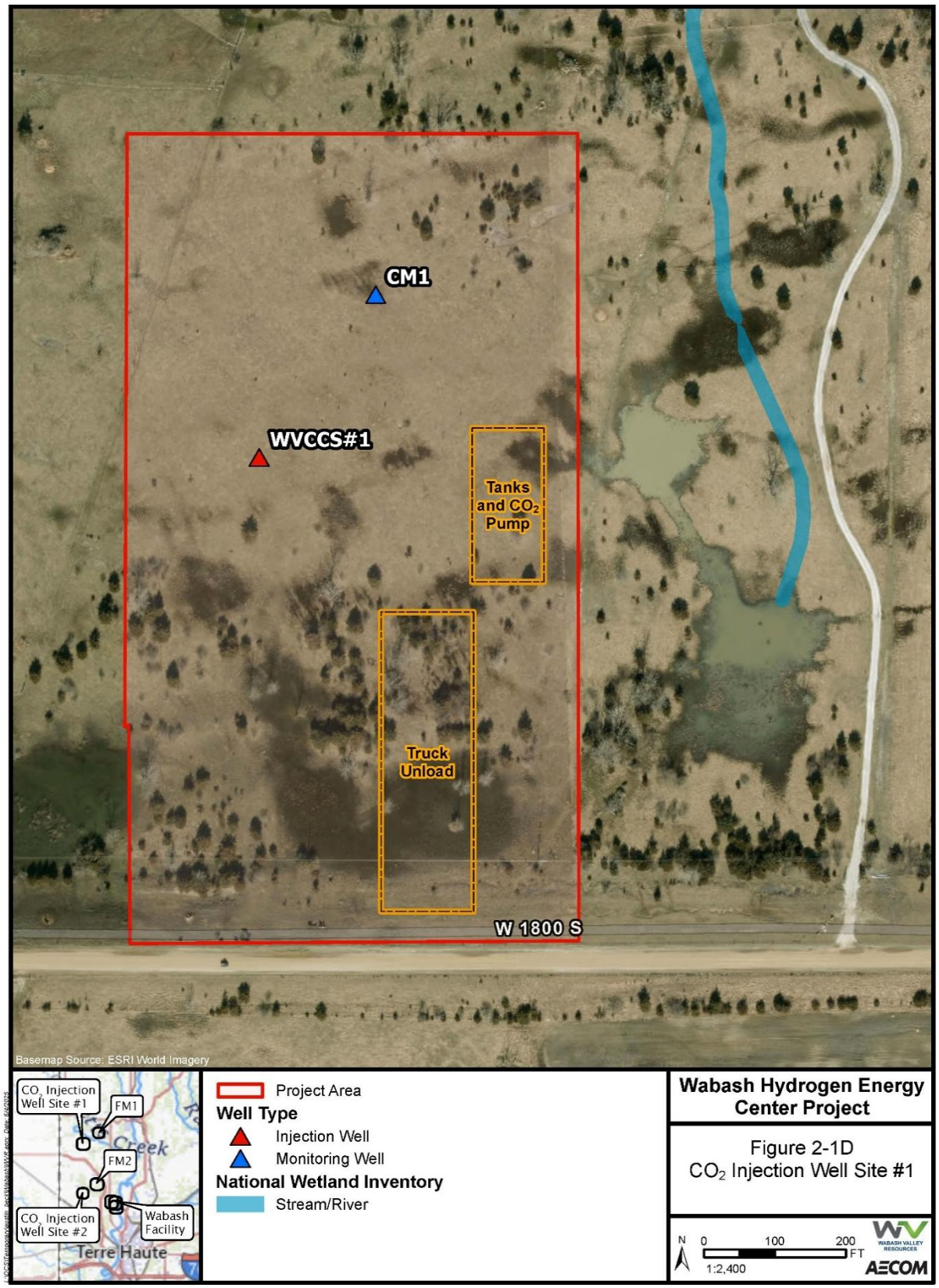


Figure 2-1E: Formation Monitoring Well #1

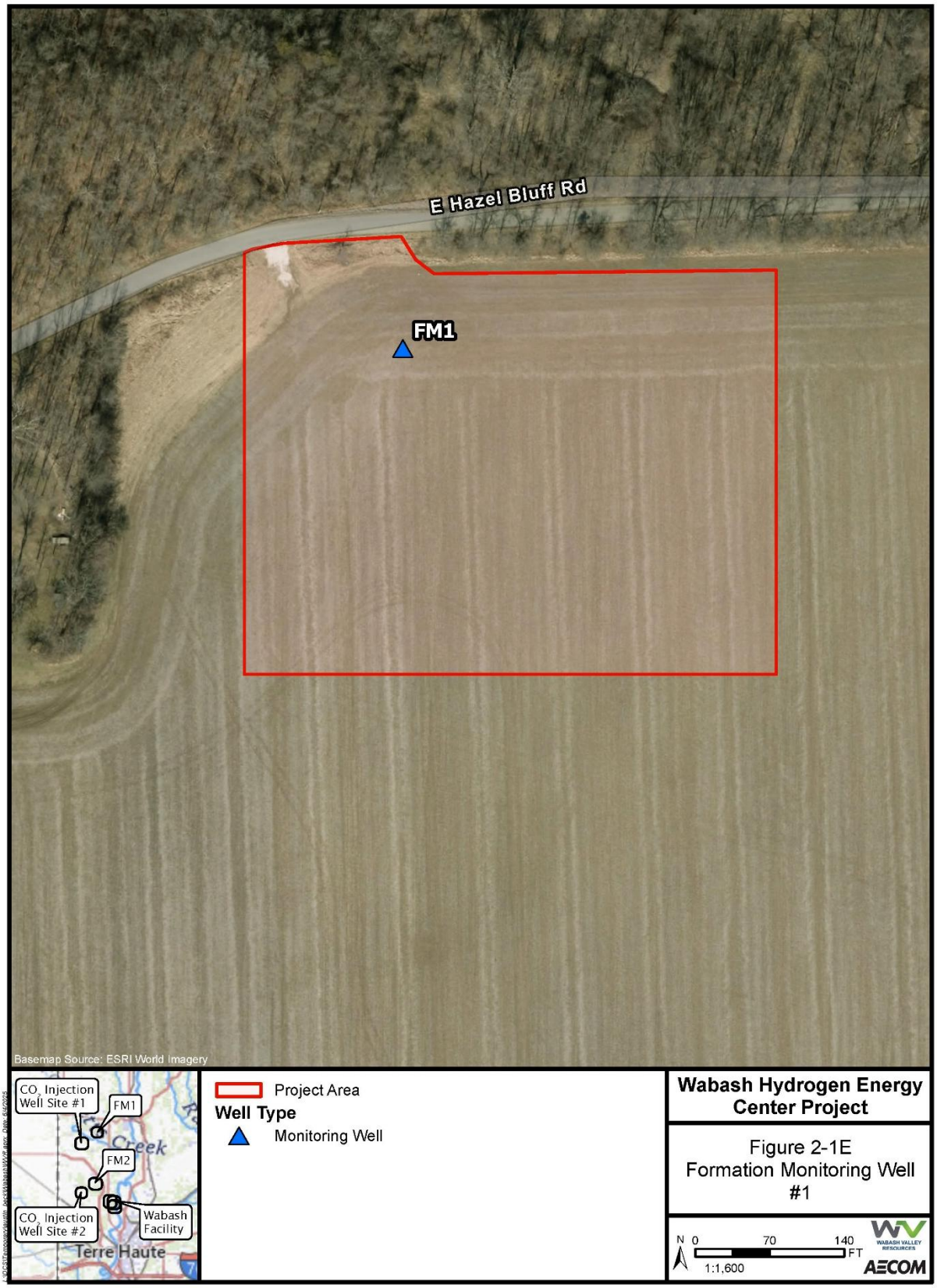
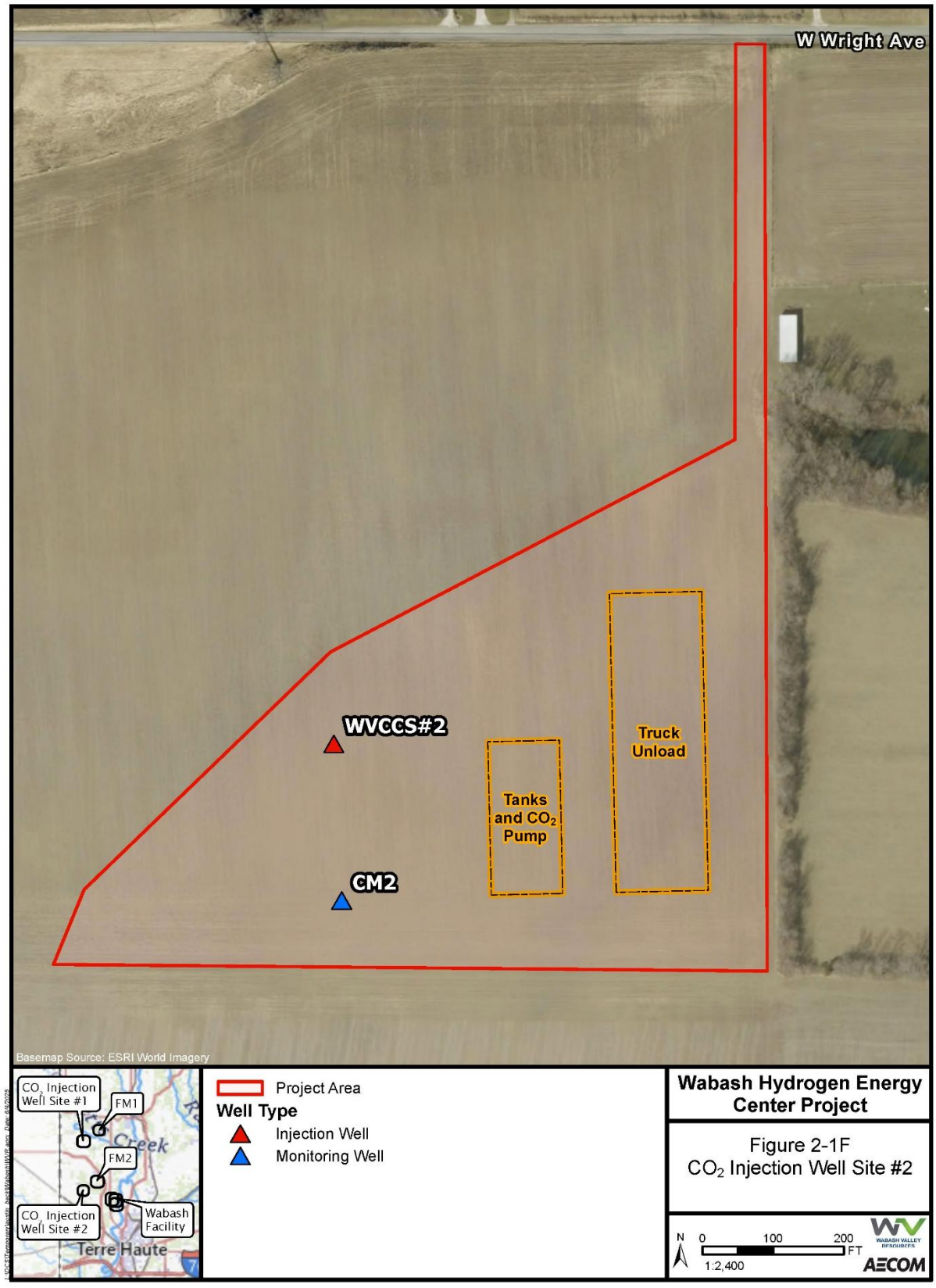


Figure 2-1F: CO_2 Injection Well Site #2



2.3 Construction

Overall Project construction will cover an approximately 143.21-acre area (i.e., the limits of disturbance [LOD]). This consists of the approximately 106-acre Wabash Facility and the 37 acres of land required to construct the CO_2 injection well sites and FM wells (**Figure 2-1**). **Table 2-1** lists the LOD associated with each Project component, as presented in **Figures 2-1A** through **Figure 2-1G**.

The Wabash Facility has three primary Project components, based on location and current land use (**Figure 2-1A, Figure 2-1B,** and **Figure 2-1C**). The hydrogen production and CO_2 capture facilities will be developed on the previously disturbed site with the existing WRCGRDP facilities and infrastructure, an area of approximately 51.33 acres (**Figure 2-1A**). This will include the Project's gasification facility, CO_2 storage and loading facility, railyard, and other elements, such as sidewalks and parking areas, stormwater detention facilities, temporary construction zones, a gravel pad for electric equipment, and landscaped areas. Because a gasification facility already exists, the public utility infrastructure needed to support the Wabash Facility already exists, requiring only a connection from the an existing aboveground power corridor to the new substation that will be constructed within the gasification facility. The new ammonia synthesis facility, including storage, loadout, and attendant structures, will cover approximately 37 acres of undeveloped land directly north of the WRCGRDP site (**Figure 2-1B**). The construction laydown yards/parking areas will be non-contiguous with other components of the Wabash Facility and cover approximately 18 acres along West Sandford Avenue, northeast of the WRCGRDP facilities (**Figure 2-1C**).

CO_2 injection well Site #1 (WVCCS#1/CM1) and CO_2 Injection well site #2 (WVCCS#2/CM2) will cover approximately 17 and 11 acres, respectively (**Figure 2-1D** and **Figure 2-1F**). FM1 and FM2 will cover between 4 and 5 acres (**Figure 2-1E** and **Figure 2-1G**).

Figure 2-1G: Formation Monitoring Well #2

2.3.1 Wabash Facility

As shown in **Figures 2-1A, 2-1B,** and **2-1C**, construction at the Wabash Facility site will cover approximately 106 acres and include the following elements:

- Refurbishment of the facilities and units associated with the former WRCGRDP gasification plant, including modifications to the air separation unit to produce nitrogen
  - Petcoke feedstock offload and storage
  - Coal feedstock offload and storage
  - Feedstock slurry preparation and feeding systems
  - Gasification systems
  - Gas cooling and treatment systems
  - Sulfur removal/sulfur recovery unit
  - Raw water intake and treatment systems
  - ASU
- New hydrogen production and CO_2 capture facilities at the modified gasification plant
  - Hydrogen production, including an on-site hydrogen truck fueling station
  - CO_2 production
- The new ammonia synthesis facility
  - Ammonia production
  - Refrigerated storage tanks
  - Truck loading rack
- The new CO_2 storage and loading facility
  - CO_2 storage units
  - CO_2 loading
- Construction of laydown yards and parking areas
- Refurbishment of the railyard

General construction at the site for the Wabash Facility is scheduled to begin in the third quarter of 2025 and be completed in 2028. Equipment installation is planned to begin in the summer of 2026 and be phased in over time. Start-up for trial operations, debugging, and validation will occur sequentially as equipment is installed, beginning in the second half of 2027, with the facility becoming operational in 2028. Full production is expected in 2028. **Table 2-2** provides a summary of the estimated staffing needs for construction of the new facilities and laydown yards/parking areas.

Table 2-2: Estimated Wabash Facility Construction Staffing by Quarter

Year	2025		2026				2027				2028	
Quarter	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Employees for construction of new facilities	14	33	76	220	325	455	325	255	226	200	144	7

2.3.1.1 Gasification Facility Refurbishment

The existing gasification facility will be inspected and repaired to bring it up to like-new condition, ensuring a reliable and consistent supply of syngas to the new facilities for the generation of ammonia. The scope of gasification refurbishment includes the following:

- Inspection and refurbishment of petcoke feedstock and coal feedstock unloading and storage systems
- Inspection and refurbishment of feedstock slurry preparation and feeding systems
- Inspection and refurbishment of gasification systems
- Inspection and refurbishment of gas cooling and treatment systems
- Inspection and refurbishment of sulfur recovery systems
- Inspection and refurbishment of raw water intake and treatment systems
- Inspection and refurbishment of flare system
- Inspection, refurbishment, and modification of ASU

The gasification facility refurbishment activities listed above concerning existing systems and equipment will affect an area of approximately 14.5 acres. Refurbishment activities will be executed in a manner consistent with a maintenance outage. In other words, a focused team of skilled tradespeople will be assigned individual jobs on a daily basis. Overall control of the schedule and record keeping will be performed by facility personnel. Individual job plans for each piece of equipment have been developed to ensure that the work is properly planned and executed. During refurbishment of the existing equipment, specific tests for each piece of equipment will be performed, ensuring that the facility can be returned to service in a safe and efficient manner. Included will be piping and vessel pressure testing, electrical resistivity testing, motor rotation verification and performance testing, isolation valve leak checks, instrumentation checks and calibrations, and control system stroke testing and verification. Refurbishment activities will include recoating tanks and vessel internals, rebuilding pumps and compressors, replacing piping as required, replacing catalysts and absorbents, and performing any other activities required to bring the facility to a ready-to-run state. Once refurbishment of the gasification equipment is complete, commissioning of the facility as a single unit will begin. The facility will be brought up to operational pressure to allow pumps and compressors to run under conditions similar to normal operating conditions. This will be the final check before the facility is placed into service and begins supplying syngas to the new units.

The ASU will be refurbished under the same methodology used for the rest of the equipment at the existing gasification facility. The only deviation will be the addition of a new nitrogen purification column and nitrogen compressor, which will provide the high-pressure nitrogen that

will be used in the new ammonia synthesis production and storage facility (ammonia synthesis facility). The new nitrogen purification column will arrive on-site already assembled, thereby reducing the effort required to assemble at the existing ASU. The nitrogen compressor will be modularized to the greatest extent possible and installed within the footprint of the existing ASU.

The existing water intake system uses an intake channel to draw water from the Wabash River, along with a bar rake screen, traveling screens, and a wet well. These systems will be refurbished prior to restarting the equipment. Refurbishment will include cleaning the intake channel, repairing the bar rake system, and removing and refurbishing the traveling screens and associated drive mechanisms. All activities associated with refurbishment of the water intake system will be performed with use of land-based equipment. The existing water intake equipment was designed for much higher flows than the new facility will require; therefore, the original water pumps are no longer required. New lower-capacity pumps will be installed in the existing wet well to supply the facility with the water needed for cooling tower make-up and process requirements.

The gasification site has a material handling facility (i.e., a conveyor belt system) that was used to receive, unload, and stockpile feedstock for the gasification process. This infrastructure will be inspected and refurbished to allow the gasification facility to be restarted. The inspection process will include testing the motors, conveyors, gearboxes, and electronic controls. It is expected that the existing conveyors will require full belt replacements.

The Project will include replacing two conveyors that were removed during demolition of the adjacent coal-fired power plant. The new conveyors will transfer petcoke and coal from the train unloading station to the existing conveying system, which will transport material to the storage areas. Petcoke and coal will not be stored on-site in railcars; railcars will be unloaded within one day of arrival on-site. The new conveyors will be within the footprint of the prior conveying system and will not result in additional new disturbances to the overall plant footprint.

2.3.1.2 Hydrogen Production and CO_2 Capture Facilities

The hydrogen production and CO_2 capture facilities will be constructed adjacent to the refurbished gasification facility, within the footprint of existing disturbance at the site. Before the new facilities are constructed, a limited demolition effort, to remove existing infrastructure, will be performed to provide a clear site that is ready for the new equipment. All of the planned demolition work will involve existing assets (e.g., storage buildings, a cooling tower, foundations and pipe racks). No previously undisturbed areas will be disturbed by demolition activities. At the completion of demolition involving the existing equipment, foundations will be installed and final grading will take place. Once foundation work is completed, the new equipment will be installed. The new units will follow a modularization strategy that allows for faster field deployment. This will lower the field effort needed because the pre-assembled units will be smaller, more manageable sections. These *modules* will contain all piping, valves, and other components. Approximately 60 percent of the new facilities will be modularized. The only equipment that will not be modularized will be the vessels, which exceed shipping envelope specifications (**Table 2-3**). The vessels will arrive at the hydrogen production and CO_2 capture facilities site fully assembled, requiring only the time needed for them to be positioned on their foundations and connected to the associated piping.

Table 2-3: Shipping Envelope Specifications

Description	Cargo Length	Cargo Width or Diameter	Cargo Height	Overall Height	Gross Transport Weight (pounds/ton)
Maximum shipping envelope (over the road from TX to IN)	80 feet	16 feet	12 feet (14 feet with SL permit)	15 feet (17 feet, 6 inches with SL permit)	138,177/32.7 (requires DOT confirmation)[a]
Maximum shipping envelope (barge transport to IN, then oversized road transport in IN/IL)	100 feet	20 feet	16 feet (17 feet, 1 inch with SL permit)	19 feet, 11 inches (21 feet with SL permit)	356,000/161.48
Railroad shipping envelope (TX to IN)	65 feet	13 feet	14 feet, 6 inches	19 feet, 6 inches	615,000/279.0

[a] *Once final routes and weights are determined, required permitting will be acquired per the requirements of individual states.*
DOT= Department of Transportation

The hydrogen production and CO_2 capture facilities will be designed as a gas handling system, reducing the risk of spills and eliminating requirements for secondary containment. In locations where fluids pose a contamination risk (e.g., areas where compressors with oil will be installed), impervious paving and containment walls will be used to control any leakage from the systems. The new facilities will be incorporated into the existing flare system, with all relief valves and depressurization valves routed to the flare tower, ensuring that venting will be performed in a safe manner.

The hydrogen production and CO_2 capture facilities will follow a standard commissioning and start-up procedure. All equipment will be pressure tested to verify the absence of leaks. Once the system has passed all pre-start checks, feed from the refurbished gasification facility will be introduced and production will begin.

2.3.1.3 Ammonia Synthesis Facility

The new ammonia production and storage units will be built on a site north of the existing gasification facility. The ammonia synthesis facility will encompass an area of approximately 36.9 acres. The area is currently bisected by a Duke Energy right-of-way for energy transmission. To construct the new ammonia synthesis facility, a standing forest will need to be cleared. Once the area has been cleared of all vegetation, stumps, and roots, site preparation will commence, which will include leveling and compacting the site to bring it to the final required grade for facility construction. At completion of the initial work (i.e., when the site has been graded and leveled), mine site stabilization will begin. This will involve drilling injection wells to a depth of approximately 200 feet in the lower coal mine zone and pumping grout into the void to provide the required stabilization. The grout will be produced at two on-site batch plants. No significant waste streams will be generated during these activities. Once the site stabilization activities have been completed, equipment foundations will be installed. The ammonia production facilities will follow a modularized construction philosophy, with the bulk of the ammonia production unit being prefabricated as modules and then assembled on-site. Any equipment that cannot be modularized (e.g., large vessels, compressors, package units) will arrive on site fully assembled, then field erected on the foundations. The ammonia storage tanks will be approximately 90 feet tall and 150 feet in diameter, with a double-wall design for greater resistance to leaks. Due to the size of the tanks, they will be fully field erected.

The ammonia production unit will be primarily a gas handling system, which will reduce the risk of spills and eliminate the need for any type of secondary containment. In locations where fluids pose a contamination risk (e.g., areas where compressors with oil will be installed), impervious paving and containment walls will be used to control any potential leakage from the systems. The liquid ammonia storage tanks will use a double-wall design, providing the highest possible protection against ammonia leakage from the primary tank and associated fittings.

The ammonia production unit and the storage unit will have separate flare systems, one for the ammonia synthesis loop and one for the ammonia storage tanks. This separation is needed due to the differences in product composition. The flare systems will be designed to combust ammonia vapor rather than hydrogen gas. Both flares will be designed with the appropriate offset distance from equipment and personnel, ensuring no hazards during flaring events. The flare systems will be used for emergency situations; they are not intended for use during normal operations. Therefore, the flare systems will not be a source of emissions during normal operations. The ammonia production unit and storage unit will be equipped with perimeter monitoring systems that will alert personnel to any potential leakage before ammonia can leave the boundary of the production facility.

2.3.1.4 CO_2 Storage and Loading Facility

The CO_2 captured within the hydrogen production and CO_2 capture facilities will be sent to the on-site CO_2 storage and loading facility, which will cover approximately 3.8 acres. This facility will be constructed on the east side of the existing gasification facility, in the area where the former coal storage yard for the Duke Energy coal-fired power plant was located. The area for the CO_2 storage and loading facility will first serve as a laydown yard and parking area to support construction activities. During the construction period, this area will be converted to the CO_2 storage and loading facility. The coal storage area was excavated during demolition activities performed by Duke Energy. Excavation removed any remaining coal and subsurface structures (e.g., reclaim conveyers, feed hoppers) to prepare the site for future use. To construct the facility, the area will be filled with excess material from the grading activities associated with the ammonia synthesis facility. Once the area is filled and brought to the same grade as the surrounding area, it will be used as a laydown yard/parking area during the initial construction period. Construction of the CO_2 storage and loading facility will include the installation of foundations for the required storage vessels, gas recycle compressors, and loading racks. In addition, the area will be paved. A full description of the equipment, as well as the hydrogen fueling station, is presented in Section 2.4.1.4.

2.3.1.5 Construction of Laydown Yards/Parking Areas

Both equipment laydown yards and parking areas will be needed to support construction activities (e.g., storing and staging incoming materials for installation). Therefore, four unique areas have been identified for the Project to use. As shown in **Figure 2-1A** and **Figure 2-1C**, these areas include the current agricultural fields south of Sandford Avenue, the petcoke fuel storage yard, the former coal storage yard, and the former parking area for the Duke Energy coal-fired power plant. The agricultural fields on the south side of Sandford Avenue are the only areas that were not disturbed by the former industrial activity. This area will be flattened and overlain with gravel, which will provide a suitable base for parking and equipment storage. At the completion of the construction, the gravel will be removed and the area returned to its original condition. No ongoing operations will occur in the agricultural areas. The petcoke storage yard and coal storage yard also will be flattened and overlain with gravel, which will provide a suitable base for parking and equipment storage. At the completion of the construction, to support plant operations, this area will be used for the Project's petcoke storage yard and coal storage yard. The former coal storage yard will be filled with suitable fill (e.g.,

excess material from ammonia synthesis facility grading), then overlain with gravel. This area will be used in ongoing plant operations. No additional activities will need to be performed in the area of the former Duke Energy parking lot because it is already paved and suitable for parking.

2.3.1.6 Railyard

The Project includes use of an existing railyard. The railyard, which is approximately 4,825 feet long (0.9 mile), has, at its widest point, six tracks of various lengths. Because adequate rail access is already available to support the Project, no new rail infrastructure will need to be constructed. The existing railyard will be inspected and refurbished to ensure safe and efficient performance. The inspection will determine the condition of switching equipment, railroad ties, the rails, and associated equipment. Refurbishment will include the replacement of switching equipment, railroad ties, and rail sections that are determined to be in poor condition. Included will be cleaning the rail bed and replacing rail bedding (gravel), as required.

2.3.2 CO_2 Injection Well Sites

WVR will construct the CO_2 sequestration infrastructure in accordance with the two Class VI underground injection control (UIC) permits issued by EPA and applicable state requirements. The permits can be found on the EPA UIC website (EPA 2024a). In accordance with permit requirements, WVR will construct two CO_2 injection wells: WVCCS#1/CM1 in Vermillion County and WVCCS#2/CM2 in Vigo County. Each CO_2 injection well site is permitted to receive up to 834,390 metric tonnes per year of CO_2. Start-up, operation, and shutdown of the wells was considered in the Class VI permits. Each individual activity is allowable under the permit. If the CO_2 supply to an injection well is interrupted, the well will be shut down until the supply of CO_2 is restored. As shown in **Figure 2-1D** and **Figure 2-1F**, the CO_2 injection well sites will have the following equipment:

- CO_2 Injection Well Site #1
  - CO_2 offloading facility
  - CO_2 storage facility
  - CO_2 injection well (WVCCS#1)
  - CO_2 CM well (CM1)
- CO_2 Injection Well Site #2
  - CO_2 offloading facility
  - CO_2 storage facility
  - CO_2 injection well (WVCCS#2)
  - CO_2 CM well (CM2)

Construction of the injection wells (WVCCS#1 and WVCCS#2) and CM wells (CM1 and CM2) will follow industry standards and the requirements set forth in the EPA Class VI permits. The wells will extend to a depth of approximately 5,400 feet below ground surface. Before drilling is initiated, the sites will be graded and a gravel access road will be constructed. In addition to the access road, a gravel drill pad will be constructed to provide a level base for the drill rig to rest upon. Well construction will require a drill rig to be deployed at each site. The drill rig will be approximately 120 feet tall at the top of the mast.

Table 2-4 provides a summary of estimated staffing for construction of the CO_2 injection wells. Drilling of all four wells will take place sequentially over a 6-month period. On-site activity will

include site preparation as well as equipment deployment and installation at each location. Drilling will occur 24 hours a day, 7 days a week, as follows:

- 54 days per injection well
- 16 days for CM wells

Table 2-4: Estimated CO_2 Injection Well Site Construction Staffing by Quarter

	2025		2026				2027				2028	
Quarter	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
CO_2 injection well sites, construction employees						20	20					

For each CO_2 injection well site, the drill rig will use a closed-loop circulation system to pump drilling fluid through the drill string and then back to the surface to remove cuttings from the bore hole as the drill extends deeper. Temporary tanks will be used as part of the circulating system; open mud pits will not be used. At predetermined intervals, drilling activities will be ceased, and data collection activities will be performed. These activities will include core sample collection, well bore logging, fluid sampling, and injectivity testing. As each well is developed, casing will be used, per the requirements of Section I and Attachment G of the Class VI UIC permits. The casing will be deployed in three primary sections to ensure that areas above the primary seal have a minimum of two layers of casing to protect the surrounding formation from the CO_2 being injected to the bottom of the well bore. Drill cuttings will be stockpiled during drilling operations and then managed in accordance with Indiana regulatory requirements. It is expected that 750 cubic yards of cuttings will be generated during Project drilling.

Construction and staging activities will occur within the areas of disturbance associated with each well site, as listed in **Table 2-1**. At the end of the construction period, final injection tubing will extend from the surface to the bottom of the well; this tubing is what will carry the CO_2 from the wellhead to the injection zone. The casing deployed within the injection zone and the tubing used to carry the CO_2 from the surface to the injection zone will be 25 percent chrome alloy, providing excellent corrosion resistance (**Exhibit 2-1**). The permanent structures deployed at the surface as part of the injection wells will be the wellhead, associated surface instrumentation to track pressures and temperatures at the surface and within the well bore, and the required communication equipment to transfer data back to the main control room at each CO_2 injection well site.

As required by the Class VI permits, the Project will also use CM wells (CM1 and CM2) to ensure the safe and secure sequestration of CO_2. The CM wells will be adjacent to the CO_2 injection wells. Construction techniques for the CM wells will be similar to those for the injection wells. The CM wells, which will extend to a depth of approximately 2,400 feet (**Exhibit 2-2**), will monitor the pressure and temperature directly above the identified primary seal to ensure integrity is maintained. CM wells co-located with the injection wells will also be used to sample the lowest underground source of drinking water to verify that no adverse effects have occurred.

Exhibit 2-1: Injection Well Design

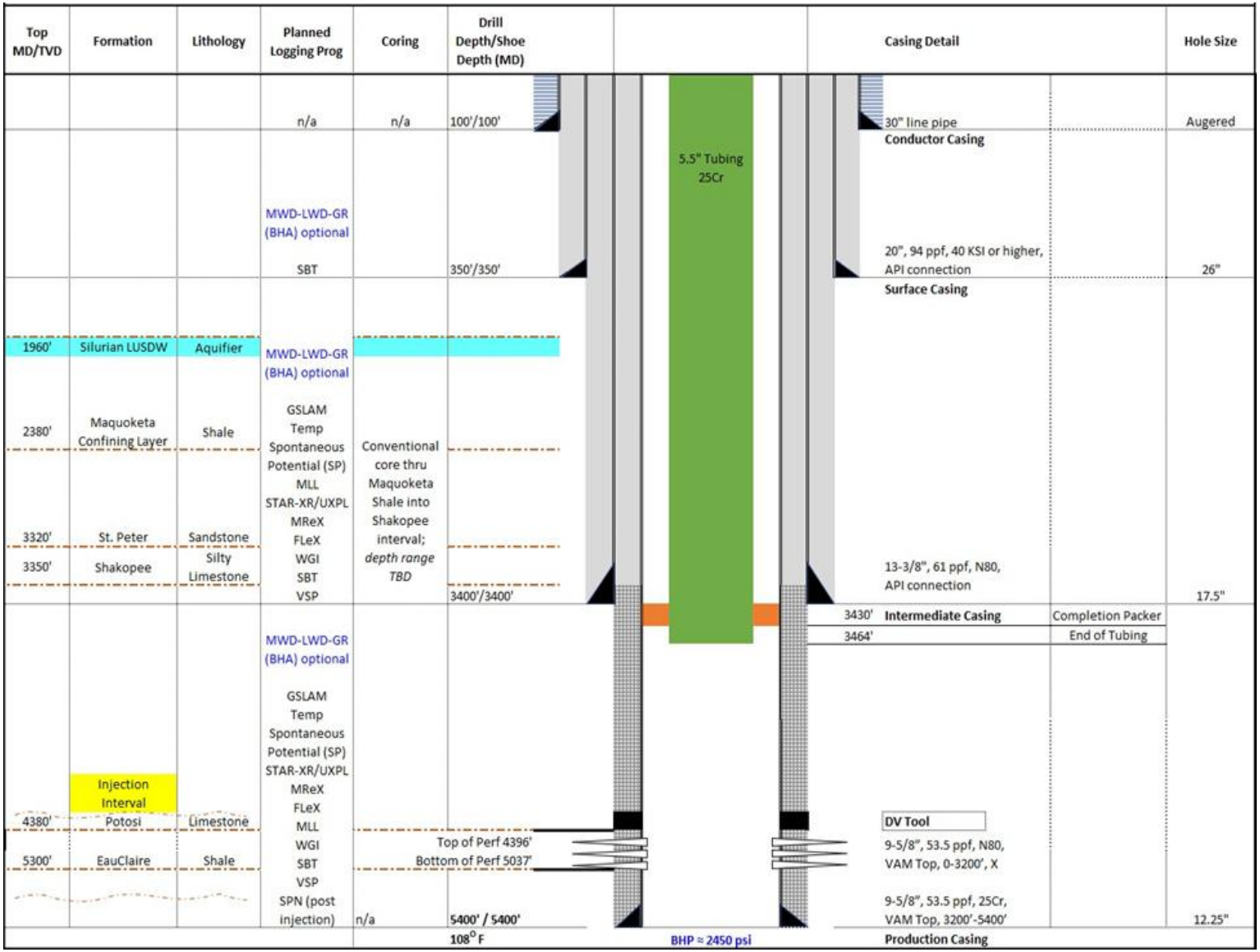
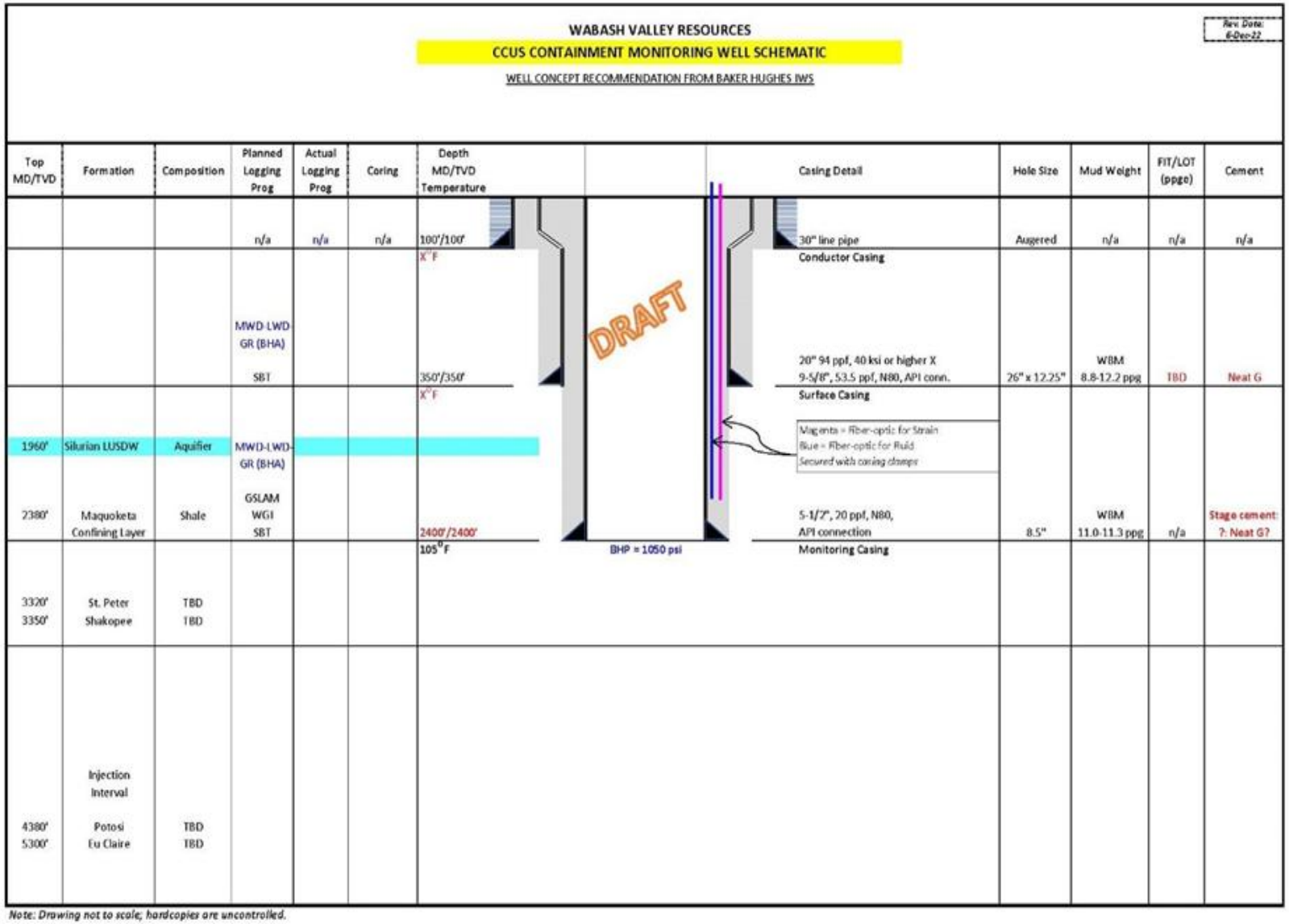


Exhibit 2-2: CM Well Design



Note: Drawing not to scale; hardcopies are uncontrolled.

Each CO_2 injection well site will have truck unloading and pumping equipment mounted on foundations. Specifically, the truck unloading equipment, storage vessels, a refrigeration unit, and CO_2 pumps will be installed on the foundations. CO_2 storage will require two 15-foot-diameter, 60-foot storage vessels at each CO_2 injection well site, providing a buffer volume of CO_2 between the unloading rack and the CO_2 pumps. The centrifugal CO_2 pumps will provide the required pressure to the wellheads. The refrigeration unit will be designed to capture gaseous CO_2 from the unloading rack and storage vessels and then compress and condense it back to a liquid, thereby preventing CO_2 emissions from the facility. The equipment will be prefabricated and delivered to the CO_2 injection well sites on individual skids as modules. Power will be supplied by existing power lines along nearby roadways. No new electrical or water services will be required for the CO_2 injection facility sites. The CM wells will share sites with the injection wells; therefore, power will be readily available. Furthermore, no upgrade to the existing electrical infrastructure will be required for the CO_2 injection well sites. For details concerning the equipment at the injection well sites, see Section 2.4.2.

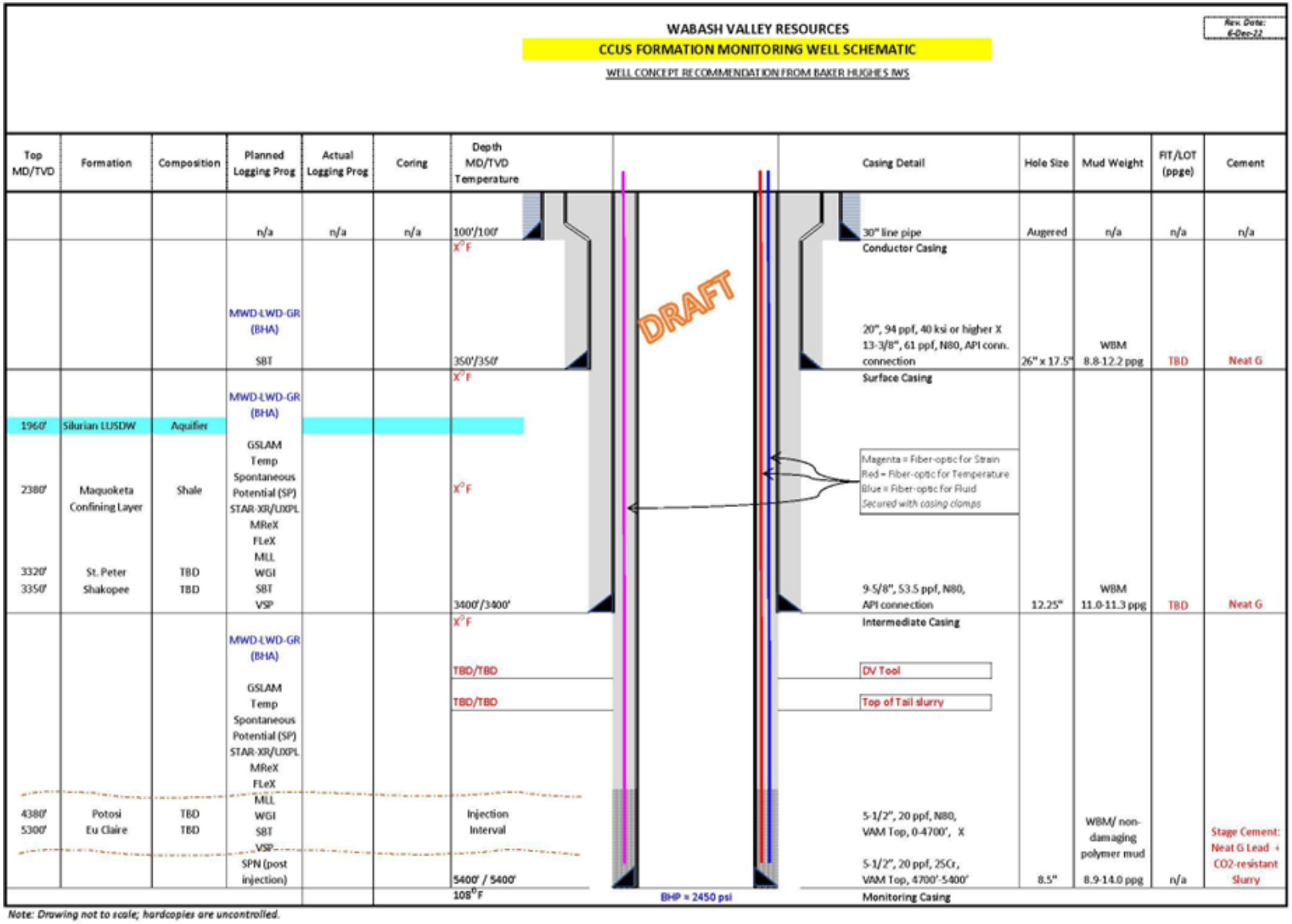
2.3.3 Formation Monitoring Wells

The FM wells will be positioned at the periphery of the expected LOD (approximately 9,500 feet from the CO_2 injection wells) and used to monitor conditions within the injection zone of each injection well. The FM wells will monitor the pressure and temperature within the injection zone and sample the formation fluids, ensuring that the CO_2 is acting as expected. The FM wells will be constructed in a manner similar to that of the CO_2 injection wells and use the same high-chrome alloy (**Exhibit 2-3**). The FM wells will not be connected to other CO_2 infrastructure in any way. All data collected will be transmitted with use of a secure wireless connection. The power requirements for the FM well sites will be met by existing power lines along nearby roadways. It is expected that each FM well will require 51 days to construct. **Table 2-5** provides a summary of the estimated staffing for construction at the FM well sites.

Table 2-5: Estimated FM Well Site, Construction Staffing by Quarter

Year	2025		2026				2027				2028	
Quarter	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
FM well, construction employees								20				

Exhibit 2-3: FM Well Design



Note: Drawing not to scale; hardcopies are uncontrolled.

2.3.4 Construction Waste Management

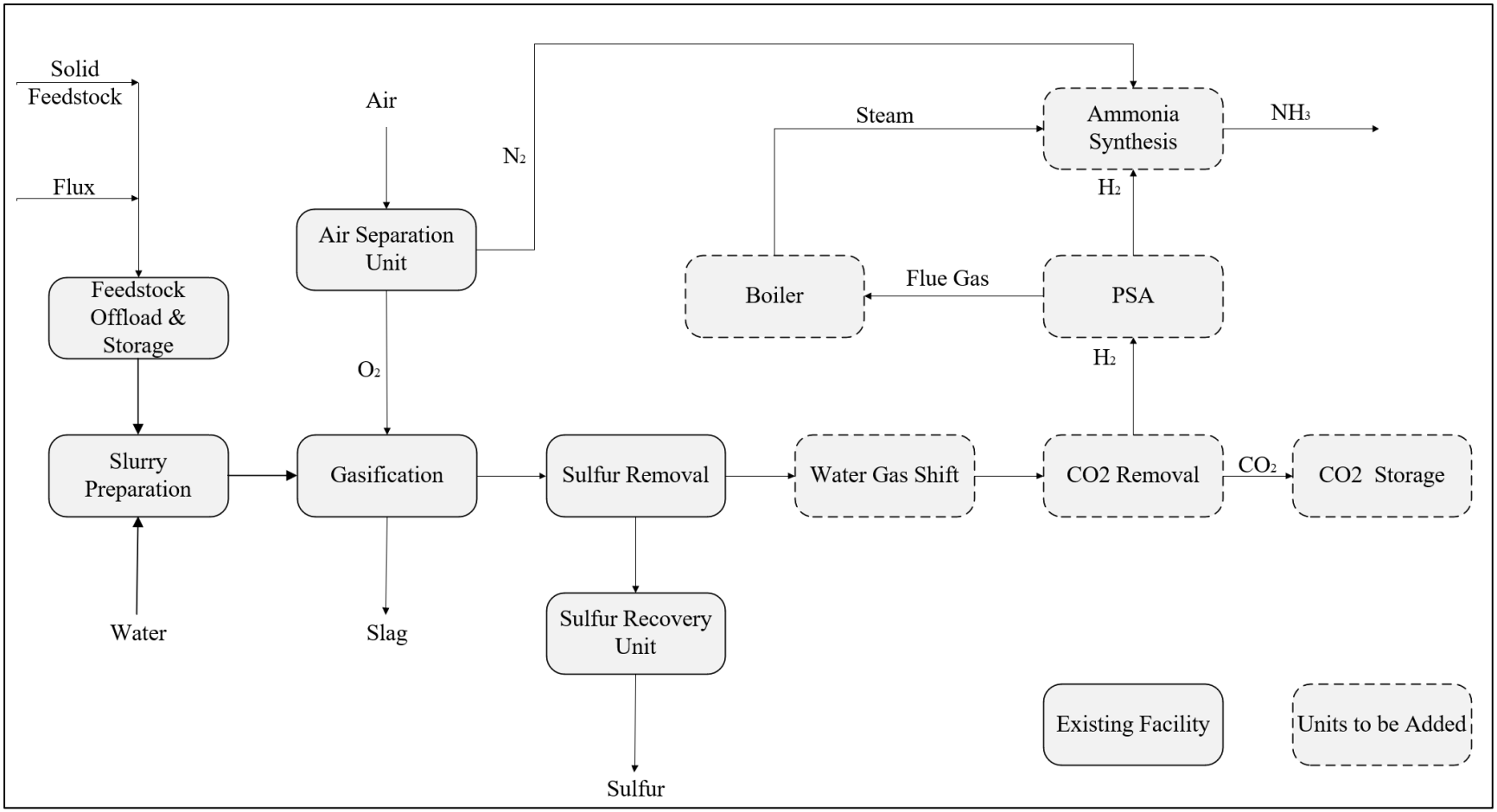
During the construction period for the Wabash Facility, work at the CO_2 injection well sites and FM wells will be carried out in compliance with federal, state and local ordinances, as will waste management operations (Section 3-11). The primary waste that will be generated during construction of the Project will be solid non-hazardous waste. A small amount of solid hazardous waste also will be generated during construction. Most of the hazardous waste generated during construction will consist of spent welding material or empty containers that stored hazardous materials. It is anticipated that less than 1 cubic yard of each type of waste will be generated monthly during construction.

Drilling the two CO_2 injection wells, two CM wells, and two FM wells will generate a waste stream of drilling fluid. At the completion of drilling for each well, the drilling fluid will be hauled off-site and disposed of at a licensed disposal facility.

2.4 Operation

The Wabash Facility will transform solid feedstock (petcoke and coal) through a variety of chemical reactions and processes to produce anhydrous ammonia (see **Exhibit 2-4**). The facility will require approximately 600,000 tons of feedstock annually. The feedstock will consist primarily of petroleum coke, which may be up to 25 percent coal, and produce approximately 550,000 tons of anhydrous ammonia. The existing gasification facility will generate the required syngas, a blend of carbon monoxide (CO), hydrogen, and CO_2, that will be sent to the new hydrogen purification and carbon capture units. All CO in the gas will be converted to CO_2 through a water-gas shift process, captured, and transported by truck for sequestration at the CO_2 injection well sites at a rate of approximately 1.67 million metric tonnes per year. The hydrogen stream will then be sent to the new ammonia synthesis facility. The ammonia produced will be stored on-site in refrigerated tanks before being loaded onto customer trucks for shipping.

Exhibit 2-4: Overall Block Flow Diagram



2.4.1 Wabash Facility

2.4.1.1 Gasification Facility

The gasification facility will transform up to 2,000 tons of petcoke daily and up to 500 tons of coal, depending on the targeted blend ratio. As a byproduct of petroleum refining processes, petcoke can be reused as feedstock for the Project. Petcoke and coal will be received at the railyard and stockpiled in an existing petcoke storage area before being sent to the slurry preparation system. The petcoke storage area, including the co-located coal storage area, is equipped with perimeter ditches and a French drain, ensuring that contact stormwater is routed through stormwater control ponds before being discharged, per the requirements set forth by the Indiana Department of Environmental Management (IDEM) within the National Pollutant Discharge Elimination System (NPDES) permit. The slurry preparation system will receive the feedstock (petcoke and coal) and, with recycled water from downstream process units, grind and blend it to generate the slurry that will be fed to the gasifier. The feeding system will use high-pressure, positive-displacement pumps to inject the slurry into the gasifier.

Within the gasifier, the petcoke and coal will be partially combusted by co-injecting oxygen. Partial combustion will provide the required heat needed to initiate gasification reactions; this will generate the syngas that eventually will be fed to the downstream units. The syngas generated in the gasifier will consist primarily of CO, hydrogen, and CO_2. The syngas will be cooled within the high-temperature heat recovery unit where high-pressure steam will be generated. This high-pressure steam will be used within the hydrogen and CO_2 production and capture facility. After cooling, the syngas will be filtered to remove particulate matter before being sent to the sulfur removal system. Filtered particulate matter from the gas will be recycled back to the gasifier.

Within the sulfur removal system, the syngas will contact a methyldiethanolamine solvent to remove hydrogen sulfide. The removed hydrogen sulfide will be sent to the sulfur recovery unit where it will be converted to elemental sulfur, which will be placed in railcars and sold. Sulfur will not be stored in on-site rail tank cars; loaded tank cars will be dispatched per buyer's requirements. It is anticipated that seven to eight tank cars with sulfur will be dispatched weekly as a component of outgoing trains with empty petcoke and coal railcars.

2.4.1.2 Hydrogen Production and CO_2 Capture Facilities

The hydrogen production and CO_2 capture facilities will receive cooled, filtered, and de-sulfured syngas from the gasification facility. The incoming syngas will be compressed in a new compressor to increase the pressure from approximately 345 to 770 pounds per square inch gauge (psig). After compression, the syngas will enter the CO shift reactors. The high-pressure steam generated in the gasification facility will be injected into the syngas stream to provide the proper water-to-CO ratio, thereby ensuring proper operation of the shift unit. Within the CO shift reactors, the CO in the gas will react with water to create CO_2 and hydrogen. After the CO shift, the gas will be cooled within air coolers before being sent to the dehydration unit, which will consist of three molecular sieve absorbers. These will be operated in sequence, allowing regeneration of the absorbent as it becomes saturated with water. The gas leaving the dehydration unit will have a water content of approximately 20 parts per million (ppm). From the dehydrators, the gas will enter the fractionation system, which will separate CO_2 from hydrogen. The fractionation system, which relies on the difference between the temperature of the CO_2 condensation and the temperature of the hydrogen, will consist of the fractionation column, main exchanger, refrigeration compressor, and liquid CO_2 pumps. The closed-loop refrigeration system will provide the temperature reduction necessary to condense the CO_2 to a liquid state within the fractionation column. The gaseous hydrogen stream leaving the column will be sent to

a pressure swing adsorption (PSA) system for further refinement. The condensed CO_2 will be removed from the column by pumps, then sent off to be loaded onto trucks. The final step for the hydrogen production and CO_2 capture facilities, the PSA system, brings the purity of the hydrogen to 95.5 percent. All tail gas from the PSA will be recycled back to the fractionation system to avoid emissions from the unit.

2.4.1.3 Ammonia Synthesis Facility

The ammonia production and storage units will receive hydrogen from the upstream PSA system and nitrogen from the ASU. The hydrogen from the fractionation unit will be further purified in a second PSA system within the ammonia synthesis facility. The hydrogen leaving the PSA system will have a purity of approximately 99.5 percent; the nitrogen from the ASU will have a purity of 99.99 percent. The two feed streams will enter the main compressor/circulator by suction as part of the ammonia production process. The compressor will bring the gas to the required pressure, approximately 1,850 psig, and circulate it through the ammonia synthesis loop. The synthesis loop will consist of a main reactor, which will be loaded with AmoMax catalyst to stimulate the Haber-Bosch reaction. The ammonia reaction will be exothermic; the heat generated will be recovered and used to generate steam. This steam will be used as the driving force for the two main compressors in the ammonia synthesis facility. The ammonia generated in the reactor will be removed from the gas stream by condensers. Once condensed, the liquid ammonia will be forwarded to the ammonia storage tanks. Two double-walled ammonia storage tanks with a capacity of 30,000 metric tonnes will be used. The ammonia storage tanks will operate at near atmospheric pressure. A dedicated vapor control system will reinject boil-off gases back into the tanks to maintain tank temperature and prevent ammonia emissions from the storage systems. Ammonia from the storage system will be pumped to the truck loading area for eventual shipping to customers by third-party transporters. The ammonia production facility will be equipped with ammonia detectors within the facility and around the periphery to detect any potential ammonia releases.

2.4.1.4 CO_2 Storage and Loading Facility

The CO_2 storage and loading facility will receive liquid CO_2 from the hydrogen production and CO_2 capture facilities. The CO_2 will have a purity in excess of 99.5 percent, per the requirement of the Class VI UIC permits. The CO_2 will be received at the CO_2 storage and loading facility at approximately 37ºF. The stream will then be cooled to 2.76 ºF before being stored. The storage system, with its 10 pressurized storage vessels, will be designed with a capacity equal to 48 hours of production to accommodate any short-term interruption in trucking. Each 15-foot-diameter, 60-foot storage vessel will have a capacity of 317,000 gallons (1,100 metric tonnes). Total CO_2 storage capacity will be 11,000 metric tonnes. CO_2 will be pumped from storage tanks to the 15-bay truck loading area. Any vapors from truck loading will be captured and recondensed using a refrigeration system, then returned to the storage tank to avoid fugitive emissions.

The hydrogen fueling facility will be co-located with the CO_2 storage and loading facility. The fueling station will be capable of fueling two trucks simultaneously. The hydrogen fueling facility will receive hydrogen directly from the hydrogen production facility. The hydrogen will be compressed to the required delivery pressure and stored in three storage vessels with a capacity of 32 kilograms of hydrogen each. This will provide an adequate buffer volume and allow multiple trucks to be fueled at the same time. Total hydrogen usage for trucking will be de minimis, accounting for only 1 percent of the total hydrogen production at most.

Five hydrogen fuel cell trucks will be dispatched each hour (i.e., one truck every 12 minutes) 24 hours a day, 7 days a week to transport CO_2 from the CO_2 storage and loading facility to the

CO_2 injection well sites. Therefore, approximately 10 trucks will travel to or from the CO_2 storage and loading facility each hour (i.e., 240 truck trips per day). WVR intends to have both CO_2 injection well sites operating at the same time so it can alternate the dispatch of CO_2 transport trucks between the two wells during normal operations. Should a CO_2 injection well site go offline or be inaccessible, Wabash will use its on-site CO_2 storage capacity on a short-term basis (i.e., 48 hours); it will also reduce the production of CO_2 to address long-term accessibility issues (i.e., more than 48 hours). The CO_2 transport trucks serving injection well Site #1 will be hydrogen fuel cell semi-trucks with 48-foot trailers (total length of 68.5 feet). These will transport up to 25 tons (50,000 pounds) of CO_2 per trip and have a gross vehicle weight of up to 80,000 pounds. The CO_2 transport trucks serving injection well Site #2 will be large hydrogen fuel cell trucks (up to 38 feet long). These will transport up to 25 tons (50,000 pounds) of CO_2 per trip and have a gross vehicle weight of up to 80,000 pounds.

2.4.1.5 Railyard

The railyard associated with the gasification facility will be operated during the day to receive incoming shipments of feedstock. The feedstock will be delivered to the site and received at the fuel unloading area. Petcoke will require approximately 140 railcars per week; moving and storing the petcoke on-site will require approximately two trains per week. Coal deliveries will require up to 35 railcars per week, depending on the blend ratio; moving and storing coal on-site will require approximately one train every 2 weeks. One railcar per day will be loaded with elemental sulfur; export will depend on the terms of the buyer. With respect to the estimated frequency for shipments, on average, railcars will be dispatched every 2 weeks.

2.4.2 CO_2 Injection Well Sites

The CO_2 injection wells will be operated in accordance with the requirements set forth in the Class VI UIC permits issued to WVR by EPA. The injection wells will be sized and permitted to receive the volume of CO_2 expected to be generated by the Project. CO_2 will be delivered to the CO_2 injection well sites by tanker trucks and unloaded using an eight-bay truck unloading rack. The hydrogen fuel cell trucks will be capable of transporting up to 25 tons (50,000 pounds) of CO_2 per trip. CO_2 unloading operations will be performed by the truck drivers using a semi-automated system. The unloaded CO_2 will be transferred into two surge vessels that will provide suction to the CO_2 injection pumps. The surge vessels will have a capacity of 317,000 gallons (1,100 metric tonnes) and be 60 feet long, with a diameter of 15 feet. The surge vessels will be mounted in a horizontal position to limit visual impacts. The truck unloading system and surge vessels will be equipped with a dedicated boil-off gas recompression system that will prevent CO_2 emissions to the atmosphere at the CO_2 injection well sites. The equipment at the sites will be designed to not exceed 85 decibels (dB) at a distance no greater than 3 feet from the equipment. If necessary, acoustic enclosures will be used to meet the sound-level requirements.

The CO_2 will be delivered to the wellheads at approximately 1,000 psig. Once the CO_2 reaches the injection zone, it will achieve the pressure and temperature needed to move it to a supercritical, or dense, phase state. As a supercritical fluid, the CO_2 will disperse into the surrounding injection zone with its highly porous and permeable dolomite. The injection wells will be equipped with a full suite of pressure, temperature, and flow monitoring equipment, providing an instantaneous indication of conditions in the injection zone, at the wellhead, and along the entire well string. Any deviation will result in alerts at the main control room; automated shutdowns will occur if critical conditions are exceeded. All monitoring parameters are set forth in the Class VI permits issued by EPA. In addition, the Project will be required to follow the rules set forth in the Greenhouse Gas Reporting Program and monitor and report any fugitive CO_2 emissions.

2.4.3 Formation Monitoring Wells

The FM wells will be used primarily to remoting monitor conditions within the CO_2 injection zone. The wells will be equipped with pressure and temperature instruments that will log and report conditions to the main control room at the Wabash Facility. The only daily operational activity associated with the FM wells will be a visit to the FM well sites to ensure no irregular conditions and a secure environment.

2.4.4 Staffing and Operational Timeframe

Staffing for the Wabash Facility will require two 12-hour shifts each day working 24 hours a day, 7 days a week. Staffing will reach full capacity in the third quarter of 2027. The maintenance, engineering, and support staff will work 8 hours a day, 5 days a week. The total direct employee headcount for operation of the facility will be approximately 120 to 125, with an additional 30 to 35 on the contract maintenance and services support staff. CO_2 trucking will require approximately 90 employees working 24 hours a day, 7 days a week. The two CO_2 injection well sites and two FM wells will not have a permanent staff. The anticipated staffing plan is provided in **Table 2-6**.

Table 2-6: Estimated Wabash Facility Operations Staffing

Year	2025		2026				2027				2028		
Quarter	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Percentage of employees	11%	15%	22%	27%	31%	35%	40%	46%	65%	100%	100%	100%	100%

2.4.5 Operations Waste Management

2.4.5.1 Gasification Facility

Non-hazardous waste generated at the gasification facility during operations will consist of metal, wood, paper, cardboard, plastic, glass, and containers for non-hazardous materials. See Appendix C for a complete summary of the waste streams. Waste will be removed from the gasification facility and disposed of by a commercial waste management company. The primary waste stream from the gasification facility will be the slag generated as part of the gasification process. This non-leaching product is expected to pass all required toxicity characteristic leaching procedure tests and be disposed of as non-hazardous waste or used as a clean fill material. For example, the slag product could be used as daily cover for landfills in the vicinity of the Wabash Facility or could be sold for other beneficial uses.

Dry cake produced in the evaporative crystallizer from process condensate will contain concentrations of arsenic, selenium, lead, and nickel. The dry cake will be removed from the site and disposed of by a licensed commercial hazardous materials contractor. See Section 3.11 for a review of waste and waste management impacts during construction and operation of the Project.

2.4.5.2 Hydrogen Production and CO_2 Capture Facilities

Non-hazardous waste generated at the hydrogen production and CO_2 capture facilities during operations will consist of metal, wood, paper, cardboard, plastic, glass, and containers for non-hazardous materials. Waste will be removed from the site and disposed of by a commercial waste management company. The facilities will have no specific waste streams. As a gas

processing unit, solid process waste will not be generated. See Section 3.11 for a review of waste and waste management impacts during construction and operation of the Project.

2.4.5.3 Ammonia Synthesis Facility

Non-hazardous wastes generated at the ammonia synthesis facility during operations will consist of metal, wood, paper, cardboard, plastic, glass, and containers for non-hazardous materials. Waste will be removed from the site and disposed of by a commercial waste management company. The ammonia synthesis facility will have no specific waste stream. As a gas processing unit, solid process waste will not be generated. See Section 3.11 for a review of waste and waste management impacts during construction and operation of the Project.

2.4.6 Site Safety

The Wabash Facility will be operated and managed as a single integrated facility. Safety protocols will be applied facility-wide to ensure compliance and facilitate enforcement of company policies and procedures. The Wabash Facility will be a process safety management (PSM) facility operated under the Occupational Safety and Health Administration (OSHA) standards set out in 29 CFR 1910.119. Adherence to the PSM standards will ensure that the facility will be managed and operated in the safest manner possible. In addition to the incorporation of various safety and environmental features, as well as design measures to minimize emergencies and their effects on public and worker safety, WVR will have a site-specific emergency action plan for the Project. The emergency action plan will address potential emergencies, including chemical releases, fires, bomb threats, pressure vessel ruptures, aqueous ammonia releases, CO_2 releases, and catastrophic events. It will describe evacuation routes, alarm systems, points of contact, assembly areas, responsibilities, and other actions to be taken in the event of an emergency. The plan will include a layout map, a fire extinguisher list, and a description of arrangements with local emergency response agencies for responding to emergencies. WVR has developed a comprehensive set of safety and loss prevention policies to guide operation of the facility, ensuring that it will be operated and maintained in a safe and environmentally responsible manner. A list of the policies is provided as Appendix D.

The CO_2 injection well sites and FM well sites will be managed under the same philosophies and protocols used at the production facilities but with the additional requirements set forth in the Class VI UIC permits.

See Section 3.10 for a review of the health and safety impacts during construction and operation of the Project.

2.5 Alternatives

The alternatives reviewed in this EA that meet the purpose and need and are technically and economically feasible are the Proposed Action (i.e., providing federal financing through a loan guarantee for the Project proposed by the applicant) (see Section 1.1).

2.6 No-Action Alternative

The No-Action Alternative assumes that, without federal financial assistance from a loan guarantee, the Project will not be constructed. The Project's potential effects on the natural and human environment, both adverse and beneficial, will not occur. Chapter 3 provides a review of the Project's effects relative to the baseline No-Action Alternative.

3. ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

In each of the following sections, a specific resource area is addressed with both qualitative and, where applicable, quantitative information to concisely describe the nature and characteristics of the resource that may be affected by the Project as well as the potential direct and indirect impacts on that resource from the Project, given Project controls. A conclusion regarding the significance of impacts is provided for each resource area.

Section 3.14 provides a review of the reasonably foreseeable federal and non-federal actions in the region that have a reasonably close causal relationship to the Proposed Action that may contribute to adverse impacts when added to the impacts of the Proposed Action.

3.2 Cultural Resources

The term “cultural resources” broadly encompasses sites, objects, or practices of archaeological, historical, cultural, and religious significance. Cultural resources that are listed in or eligible for listing in the National Register of Historic Places (NRHP) require consideration under Section 106 of the National Historic Preservation Act of 1966 (NHPA) (54 U.S.C. 306108) and its implementing regulations (36 CFR Part 800), which require federal agencies to consider the effects of their undertakings on historic properties prior to approving the undertaking. Section 106 review includes consultation with stakeholders to identify historic properties, which often includes a cultural resource inventory survey and an evaluation of the NRHP eligibility of identified resources, an assessment of effects on historic properties, and consultation to resolve any adverse effects.

Federal undertakings require evaluation of cultural resources for potential significance to Native American individuals and groups from a cultural and religious standpoint. Places and practices may be eligible for protection under the American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996). Sacred sites may be identified by a tribe or an authoritative individual (Executive Order 13007). Special protections are afforded to human remains, funerary objects, and objects of cultural patrimony under the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 et seq.).

As defined in the Section 106 regulations (36 CFR Part 800.16[d]), the area of potential effects (APE) is “the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.” Within the Project APE, DOE identified different limits for the survey areas for archaeological and historic architectural resources. Project development would occur at seven locations, as described in Section 2.2. The archaeological survey area is the construction footprint of the Project at each location, otherwise known as the LOD, which covers approximately 143 acres. The historic architectural survey area includes the LOD for all seven Project elements and applies a distance buffer of 1,500 to 2,000 feet, emanating from three of the Project elements (CO_2 injection well Site #2 and both FM wells) to include the area within which non-physical effects (e.g., visual, vibrational, atmospheric, auditory) may occur.

The entire Project APE has been examined through Phase I archaeological and historic architectural field reconnaissance investigations. In summary, these investigations included:

- A Phase I archaeological survey conducted in 2018 involved the examination of 40 acres of potential development area, the entirety of which is within the Project APE. This survey

identified three archaeological sites, including two non-eligible resources and one eligible historic cemetery.

- In 2021, a cultural resources desktop review was conducted to contextualize the cultural history of Project locations and assess the potential for the presence of undocumented archaeological and aboveground historic resources within the APE that could be affected by the Project.
- In 2024, an additional Phase I archaeological field survey encompassed all previously unsurveyed elements of the Project LOD. This survey work involved a combination of systematic shovel-test excavations and full visual reconnaissance (per state guidelines) and resulted in the identification of three archaeological resources, all of which are recommended as not eligible for the NRHP.
- Phase I historic architectural field reconnaissance of the Project APE, including the distance buffers defined above, was conducted in early 2025. This survey documented 19 historic-era aboveground resources within the Project APE, all of which are recommended as not eligible for the NRHP.

The following discussions provide more detailed information on the investigations outlined in brief above.

3.2.1 2018 Phase I Archaeological Survey

Cultural Resources Analyst, Inc. (CRA), conducted Phase I archaeological investigations in support of conversion of the existing WRCGRDP site into an ammonia fertilizer production facility (Durchholz and Martin 2018). The 2018 investigations involved a field reconnaissance survey on approximately 40 acres of contiguous land, which included the majority of the area north of the existing WRCGRDP site that would be used for the ammonia synthesis facility. This survey was conducted through application of the archaeological guidelines of the Indiana Department of Natural Resources (IDNR), Division of Historic Preservation and Archaeology (DHPA), which houses the State Historic Preservation Office (SHPO) for Indiana. The survey involved full visual examination of the Project site and hand excavation of shovel tests at a 50-foot (15-meter) test interval; approximately 20 acres of the 40-acre Project area considered as part of the 2018 survey was subject to shovel testing, with the remainder visually inspected in areas with steep slopes, suitable levels of ground-surface visibility, and/or extensive evidence of modern disturbances.

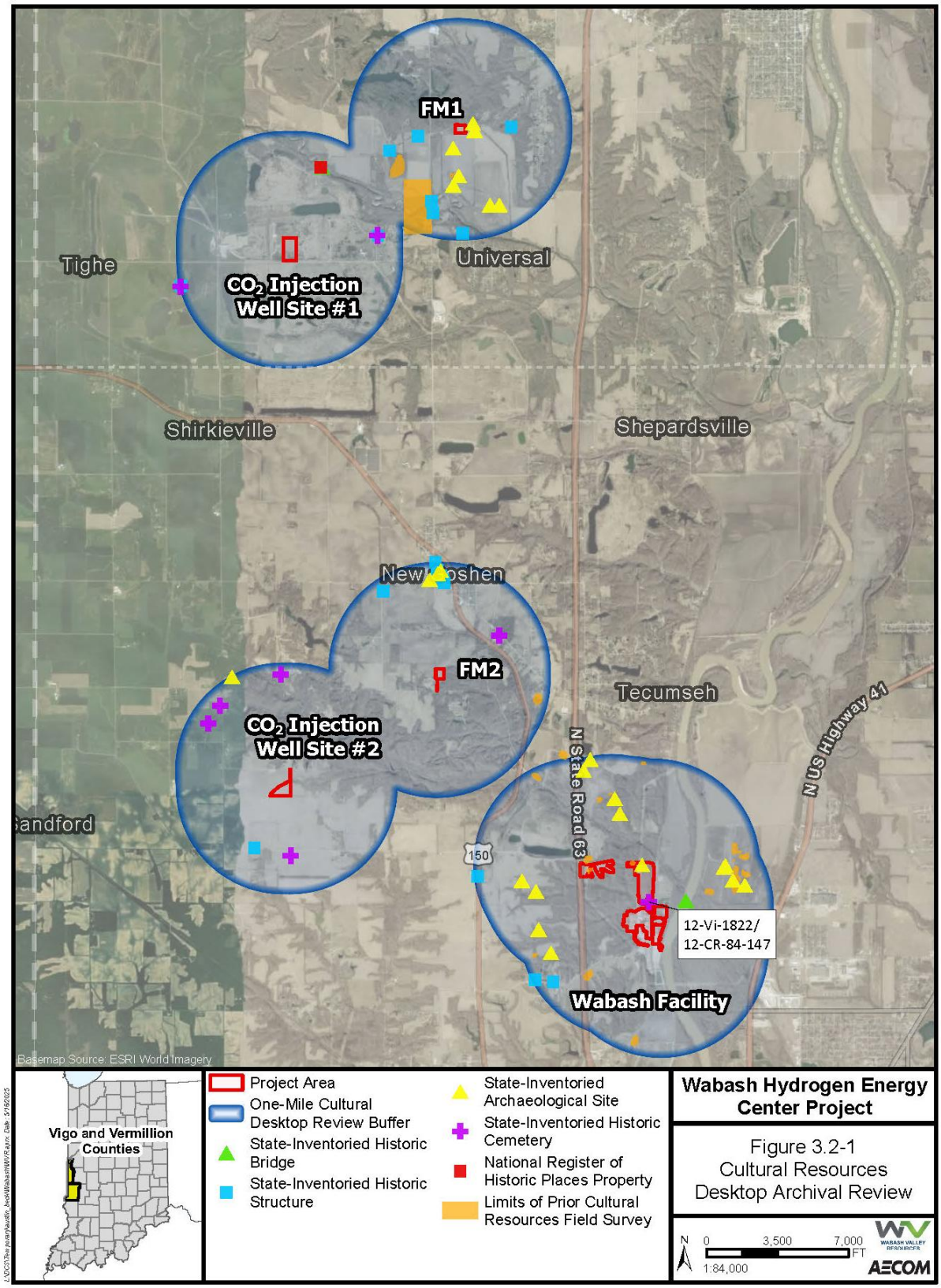
Concurrent with and as a result of the 2018 investigations, three archaeological sites were identified and inventoried with the Indiana SHPO. Archeological sites from the 2018 survey are included in **Figure 3.2-1**:

- Site 12-Vi-1822, known as Coal Creek Cemetery (and cross-listed in the State Historic Architectural and Archaeological Research Database [SHAARD] as cemetery ID CR-84-147), was inventoried as an archaeological site in 2018. Dating to the nineteenth century, the cemetery contains 10 burials related to one family. In 2019, the Indiana SHPO concurred with the recommendation that the site is most likely eligible for the NRHP under Criterion D and also protected under Indiana state law.
- Site 12-Vi-1823, a multi-component resource containing both precontact and historic materials, was recovered from excavated shovel tests excavated atop an upland ridge that was subject to survey in 2018. Due to the low frequency of materials recovered and absence of any evidence for intact subsurface deposits, the site was recommended as not eligible for the NRHP, an assessment confirmed by the Indiana SHPO in February 2019.

- Site 12-Vi-1824, an isolated findspot of a single Late Woodland/Late Precontact lithic tool fragment, was recovered from an excavated shovel test. This site was recommended as not eligible for the NRHP, an assessment confirmed by the Indiana SHPO in February 2019.

Following the submittal of the Durchholz and Martin 2018 report, additional investigations were conducted on Coal Creek Cemetery in December 2018 to define the extent of the cemetery. These investigations involved a combination of visual reconnaissance, photography, and mechanical stripping, which resulted in the identification of 10 historic-era grave shafts within and around the surviving headstones. CRA concluded that the December 2018 investigations definitively defined the horizontal extent of Coal Creek Cemetery as part of the Kelley and Martin 2018 report, which documented these investigations (SHPO ID# AR-84-00570).

Figure 3.2-1: Cultural Resources Desktop Archival review



3.2.2 2021 Desktop Cultural Resources Review

In 2021, a desktop cultural resources review was conducted in support of the Project through examination of inventoried cultural resources data specific to the Project facility locations. This review involved an examination of the data maintained by the IDNR DHPA on its online platform, SHAARD, as well as the inventories of the NRHP and National Historic Landmarks. The focus of this desktop review was inventoried cultural resources and prior studies within and up to 1 mile from the Project. This buffer was also considered for the desktop review and issues analysis to define the known context of precontact and historic activity within and around the Project site. As such, available historic-era mapping and aerial photography were concurrently examined to define the extent of historic and modern occupation and activity within the Project area as well as the elements of the Project that display an increased sensitivity for the presence of undocumented cultural resources.

The 2021 desktop review of the Indiana SHPO's SHAARD indicated the presence of six inventoried archaeological sites either within or up to 500 feet from the Wabash Facility. **Figure 3.2-1** displays the results obtained from this desktop review relative to the Project area (i.e., including all locations where disturbance would occur with the Project). Three of these resources are the archaeological sites identified during the 2018 Phase I archaeological survey, one of which (site 12-Vi-1822) was also inventoried with the Indiana SHPO as Coal Creek Cemetery (cemetery ID CR-84-147). The other three archaeological sites consist of a pair of precontact lithic scatters, documented in 1961 (12-Vi-0159 and 12-Vi-0160), and a precontact lithic and fire-cracked rock deposit (12-Vi-0635) recorded as the result of a 1990 coal mine permit survey; none of the three sites have been assessed previously for NRHP eligibility. The resources do not occur within the physical component of the Project APE.

Aside from the 2018 surveys conducted for the Project (as described above), one prior field investigation examined elements of the current Project area. The Stafford 1991 *Archaeological Evaluation and Recommendations, Proposed Expansion of Wabash River Generating Station, Vigo County, Indiana* (SHPO ID# AR-84-00080) examined a proposed expansion for the Wabash River Generating Station. This evaluation was conducted through a review of available cultural resources data and visual reconnaissance in the proposed expansion area, which had been extensively disturbed by the pre-1960s Viking Coal Mine facility and subsequent deposit of up to 5 feet of fill across the landforms by the Department of Reclamation. As a result, this report concluded that no additional archaeological investigations would be warranted due to the large degree of disturbance to the area in the twentieth century.

Concurrently with review of the data collected from the Indiana SHPO's SHAARD, available historic mapping and aerial photography of areas within 1 mile of the Project were examined to define the extent of historic and modern occupation across this section of western Indiana. U.S. Geological Survey (USGS) quadrangle maps from 1949, 1952, 1960, 1965, 1973, 1981, and 1987 were reviewed. Historic aerial photographs from the late 1940s through the present day were also examined. This sequence of mapping and photography depicts a continuity in occupation from the mid-twentieth century into the modern era. The road network remained largely unchanged during this period, with residential dwellings and farmsteads scattered intermittently adjacent to township and county roads across the southern half of the Project area giving way to large areas of strip mining in the north near the Vermillion County/Vigo County border. The southern portions of the Project area display consistent land use patterns during this period, characterized by large tracts of agricultural fields and pastures, which are broken up by thin treelines and farmsteads.

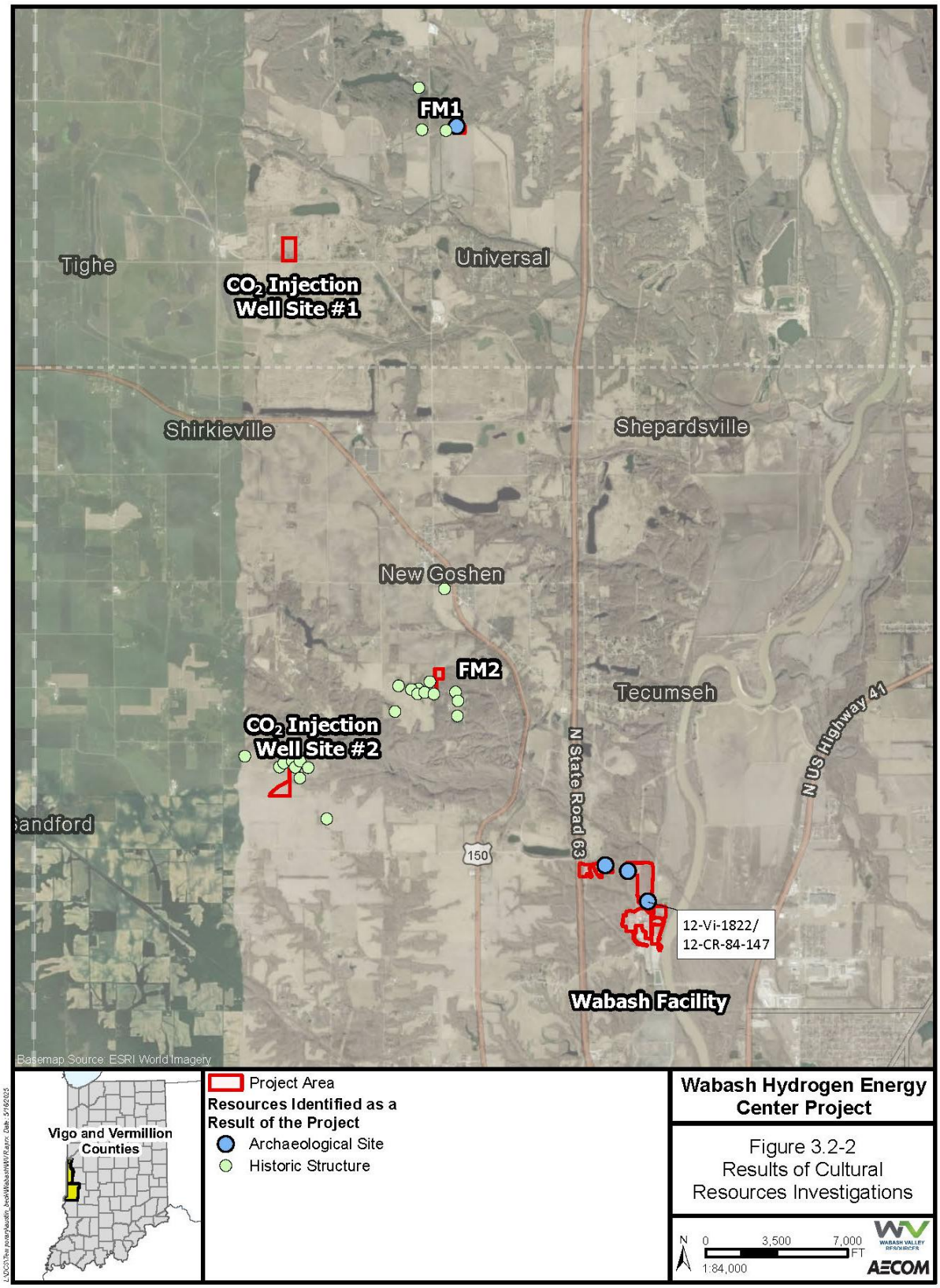
3.2.3 2024–2025 Phase I Archaeological and Historic Built-Environment Surveys

From the summer of 2024 through early 2025, AECOM archaeologists conducted the Phase I archaeological field investigations of all previously unsurveyed elements of the Project through application of the Indiana SHPO guidelines for survey work in the state. This survey involved full visual inspection, supplemented by shovel tests at standard 50-foot (15-meter) testing intervals where ground conditions were suitable for shovel testing.

The initial 2024 field reconnaissance survey resulted in the identification of two archaeological resources. These resources represent low-frequency isolated findspots of precontact lithic debris, which were identified in the absence of any evidence for larger and/or intact precontact archaeological deposits or cultural features. These precontact archaeological resources were subsequently inventoried with the Indiana SHPO as sites 12-Vi-1885 and 12-Vi-1886. In December 2024, AECOM completed additional Phase I archaeological surveys of the remaining unsurveyed elements of the APE. The results of this survey, including documentation of one new site (12-Ve-995), were incorporated into a revised Phase I survey report, which was submitted to Indiana SHPO for review in February 2025 (Appendix B). Archeological sites from the 2024/2025 investigation are included in **Figure 3.2-2**.

In January and February 2025, AECOM architectural historians conducted the Phase I historic built-environment assessment of the Project APE, as requested by the Indiana SHPO. This reconnaissance examined 22 parcels within the APE, as defined for the Project, which the desktop review suggested may contain extant historic-age aboveground resources. Of these 22 parcels, 19 were confirmed during the field reconnaissance as containing historic resources, including residential dwellings, a conservation club, and farmsteads and/or agricultural buildings dating primarily to the twentieth century (one property contained a farmhouse originally constructed in 1872). All 19 of these resources are recommended as not eligible for the NRHP. The Phase I architectural history report was submitted to the Indiana SHPO for review in March 2025 (Appendix B). Historic structures from the 2025 Phase I historic built-environment assessment are depicted in **Figure 3.2-2**.

Figure 3.2-2: Results of Cultural Resources Investigations



3.2.4 SHPO Consultation

On December 9, 2024, DOE initiated Section 106 consultation with the Indiana SHPO through electronic submittal of an initiation letter and Review Request Submittal Form. This letter referenced the previously reviewed 2018 archaeological survey report (Durchholz and Martin 2018 (AR-84-00564) and provided an electronic copy of a new 2024 archeological survey report (Collins and Seiter 2024). In correspondence dated December 30, 2024, the Indiana SHPO responded to the DOE consultation initiation letter. In response, the Indiana SHPO:

- Agreed with DOE's delineation of the proposed APE,
- Concurred with the conduct of and results from the archaeological field reconnaissance surveys undertaken in 2018 and the summer of 2024,
- Concurred with the non-eligibility recommendations for sites 12-Vi-1823, 12-Vi-0824 and the two isolated findspots identified during the summer 2024 field surveys (sites 12-Vi-1885 and 12-Vi-1886),
- Requested consideration of non-physical effects on extant historic elements of the landscape within 1,500 feet of FM1 and FM2 and within 2,000 feet of CO_2 injection well Site #2,
- Indicated that no further consideration of non-physical effects on the viewshed would be required for other Project elements, and
- Requested a Cemetery Development Plan (pursuant to IC 14-21-1-26.5) for any ground-disturbing activities planned within 100 feet of Coal Creek Cemetery (site 12-Vi-1822).

Appendix B contains copies of correspondence with and concurrence from the Indiana SHPO regarding Section 106 consultation.

After completing archaeological field surveys of all remaining unsurveyed components of the LOD in December 2024, AECOM provided an updated version of the Phase I archaeological report, along with the requisite site forms, to the Indiana SHPO in February 2025 (Collins and Seiter 2025) (AR-84-00677). In a response letter dated February 25, 2025, the Indiana SHPO concurred with the archaeologist's recommendation that one newly documented archaeological site (12-Ve-995) included in the revised report is not eligible for inclusion in the NRHP, and no further work is necessary. DOE has confirmed that a final version of the report with revisions requested by the Indiana SHPO was provided by email in March 2025.

In March 2025, a Phase I architectural survey report (Galle and Hanson 2025) was submitted for Indiana SHPO review and comment. In a response letter dated March 17, 2025, the Indiana SHPO concurred with the conclusions of the architectural survey report that there are no historic buildings, structures, districts, or objects listed in or eligible for inclusion in the NRHP within the APE.

Coal Creek Cemetery (site 12-Vi-1822/CR-84-147) is a potentially eligible cemetery and archaeological site in the vicinity of the existing WRCGRDP site. In accordance with Indiana state law (IC 14-21-1-26.5), WVR prepared a Cemetery Development Plan, which described the grounds adjacent to and within 100 feet of the site as well as Project activities within this area. The Project would avoid impacts on Coal Creek Cemetery by installing permanent fencing around a 50-foot buffer from the cemetery perimeter (as defined by the December 2018 cemetery investigations). Other safety measures would be implemented during construction activities near the cemetery, and protocols have been developed that can be implemented in the event of an inadvertent discovery during ground-disturbing activities at this location. The

Cemetery Development Plan was submitted to the Indiana SHPO for review and comment on March 20, 2025. In a response letter dated April 21, 2025, the Indiana SHPO deemed the proposed protective measures acceptable but with specific conditions, including the installation of protective fencing around a 25-foot setback from the perimeter of the cemetery.

On April 7, 2025, DOE sent a consultation letter to the Indiana SHPO, providing the agency's "finding of no historic properties affected" for the undertaking pursuant to the Section 106 review. In a response letter dated April 23, 2025, the Indiana SHPO concurred with DOE's finding, subject to the conditions prescribed in the Cemetery Development Plan for Coal Creek Cemetery, as specified in the Indiana SHPO's prior April 21, 2025, correspondence with WVR and described above.

3.2.5 Native American Tribal Interests in Indiana

Pursuant to Section 106 of the NHPA, federal or state funding or permitting for the Project necessitates consultation with the Indiana SHPO and coordination with potential stakeholders, including Native American tribal groups with interest in this area. As part of its Section 106 review process, DOE sent letters to nine federally recognized tribes for information on nearby cultural resources and comments or concerns regarding the potential for the resources to be affected by the Project. The tribes listed below were notified (additional details regarding tribal outreach are included in Appendix B). No responses or comments were received.

- Citizen Potawatomi Nation, Oklahoma
- Forest County Potawatomi Community, Wisconsin
- Hannahville Indian Community, Michigan
- Kickapoo Tribe of Indians of the Kickapoo Reservation in Kansas
- Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan
- Miami Tribe of Oklahoma
- Peoria Tribe of Indians of Oklahoma
- Prairie Band Potawatomi Nation
- Seneca-Cayuga Nation

In a letter dated May 9, 2025, DOE continued consultation with the tribes by providing the Section 106 finding of effect and supplemental materials (available upon request) for their review and comment. DOE did not receive any subsequent notification of interest in Project sites, and no tribal comments or concerns have been received to date regarding the Project.

If any prehistoric or historic archaeological artifacts or human remains are uncovered during construction, demolition, or earthmoving activities, Project work would cease in the vicinity of the discovery and the SHPO would be notified within two business days. A qualified archaeologist or a designated representative of the State Archaeologist or State Historical Center would evaluate any such discovery and, in consultation with the SHPO, implement the appropriate measures before activities would resume.

Due to DOE's findings and SHPO concurrence on the absence of historic properties within the Project APE, and because no adverse impacts on cultural resources within or surrounding the Project site would occur with the inclusion of the conditions prescribed in the Cemetery Development Plan for Coal Creek Cemetery and the controls that would be implemented in the

event of an unanticipated discovery of cultural resources, impacts on cultural resources as a result of the Project would not be significant.

3.3 Water Resources

The term “water resources” refers to the natural and artificial waters occurring at or below the Earth’s surface that are valuable or potentially valuable for human use and ecological function. These waters are generally categorized as two types of resources: groundwater (from deep bedrock aquifers to the water found in overlying sediments and soil) and surface water (such as rivers, streams, wetlands, and floodplains).

The following subsections evaluate water resources present at the Project site and in the surrounding environment, including groundwater and federally and state-regulated wetlands and floodplains. This section considers applicable regulatory frameworks and permit requirements that, along with prior review of the Project conducted by other agencies, provide the basis for assessing potential impacts of Project construction and operation. See Appendix A and Appendix B for a summary of necessary approvals and correspondence with these agencies.

3.3.1 Groundwater

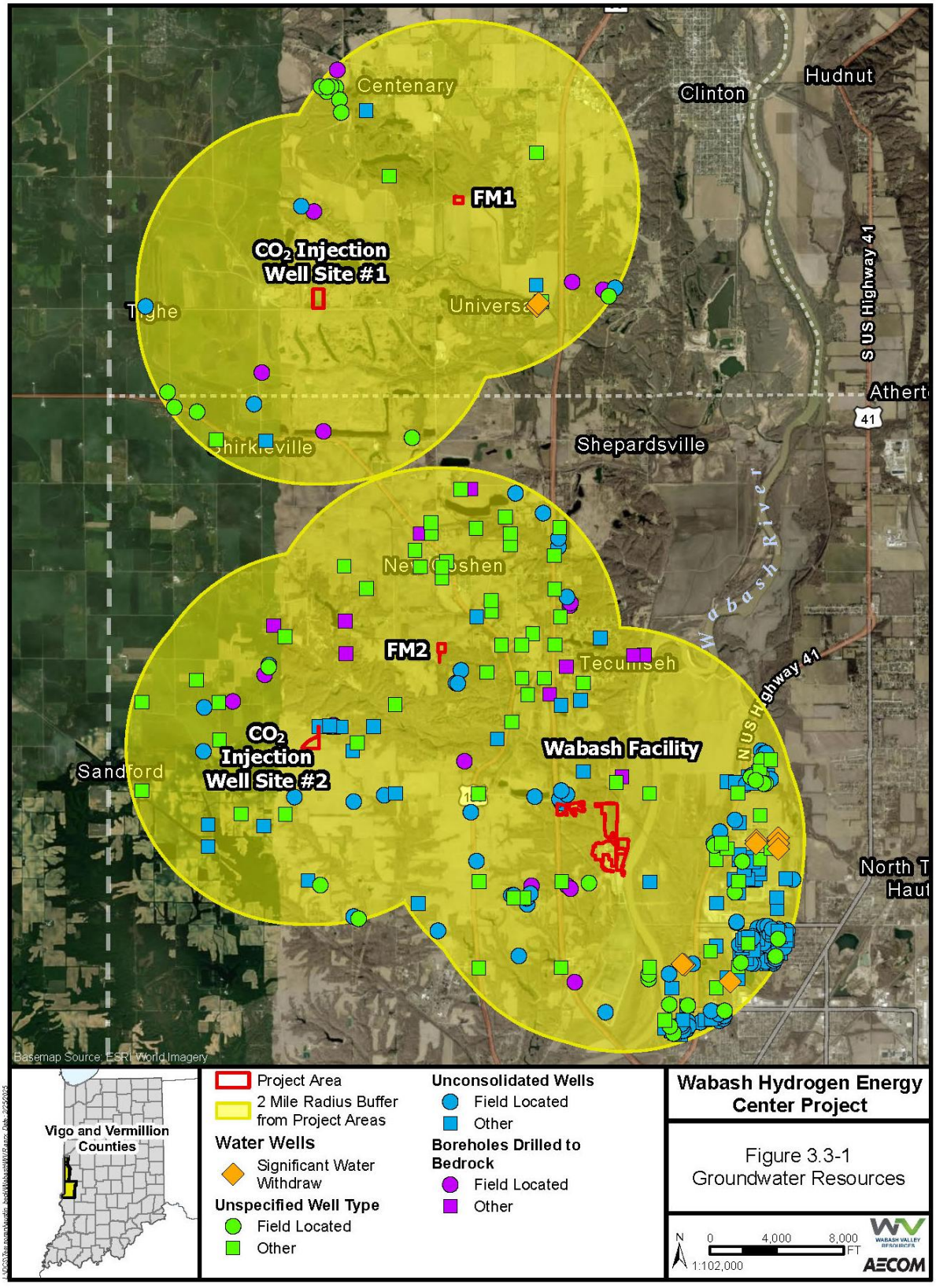
No groundwater withdrawal is proposed during construction or operation of the Project. As such, groundwater supplies in the area would not be affected by the Project. Review of the IDEM Wellhead Protection Program wellhead locator (IDEM 2024a) indicates that there are no wellhead protection areas within or around the Project area. As such, Project activities would not be expected to affect access to groundwater for public drinking water systems. Groundwater resources for local private water supplies are found in unconsolidated deposits (above bedrock) and in the first few hundred feet of bedrock.

Figure 3.3-1 shows the water wells within an approximate 2-mile radius of each Project site (i.e., Wabash Facility, both CO_2 injection well sites, and both FM wells), based on information from the water well log database maintained by the IDNR. Most wells within the search area are low-capacity wells (less than 70 gallons per minute [gpm], or 100,000 gallons per day). The only high-capacity wells/significant water withdrawal facilities (SWWFs) are on the far eastern and southeastern margins of the search area.

EPA administers the UIC permit program under the Safe Drinking Water Act (SDWA) (40 CFR Parts 144–148) to protect public health by preventing injection wells from contaminating underground sources of drinking water. CO_2 generated by the Project would be captured and managed (stored) in deep geologic formations through well injection. The injection storage process would be performed in compliance with Class VI UIC permit Nos. IN-165-6A-0001 and IN-167-6A-0001, both effective March 9, 2024, issued through the EPA UIC program. The geologic formation selected for storage/disposal of the waste CO_2 is not recognized as a drinking water source. Installation and use of the deep injection wells in compliance with the UIC permit program would ensure that drinking water sources would not be affected by the injection activity.

Details contained in water well logs housed in the IDNR repository indicate that the deepest water supply wells in the search area are at depths of approximately 300 to 419 feet. As stated in the approved Class VI UIC permits for the Project, the target injection zone for the injection wells is between approximately 3,970 and 5,162 feet deep. This zone is overlain by a competent cap/seal formation, extending from about 2,400 to 2,700 feet deep. As such, operation of the injection wells at the permitted target depths would not adversely affect local groundwater resources present at substantially shallower depths above the cap/seal formation.

Figure 3.3-1: Groundwater Resources



The Illinois State Geological Survey (ISGS) performed extensive geological testing to determine the suitability of the WVR site for geological sequestration of CO_2 (Sarathi et al. 2021). The testing included 2D seismic evaluations of the subsurface to identify potential faults or fractures that would affect the storage zone or the primary seal. Evaluation of the 2D seismic data by ISGS found that no faults or fractures existed that could compromise the integrity of the primary seal. In addition to the 2D seismic surveys, a stratigraphic test well was constructed at the existing WRCGRDP site to investigate and quantify the storage capacities of varying formations, along with integrity of the seal formations. Subsurface evaluations included wire-line logs, step-rate testing, drill-stem testing, and injectivity testing. Along with the in-situ testing, full-bore and sidewall cores were recovered. ISGS interpreted the testing results and used the data to develop extensive subsurface characterizations, which were then incorporated into a computer model that predicted the behavior of the CO_2 during the injection period and 50 years post-injection. As stated in the UIC permits, the Pacific Northwest National Lab (PNNL) also performed independent modeling using the "subsurface transport over multiple phases" process for a 12-year injection period and 50 years post-injection. The PNNL model replicated the ISGS model results, with both institutes returning results that indicate the WVR site is more than capable of accepting all CO_2 generated by the Project.

3.3.2 Surface Water

All Project sites are within the South Salt Creek-Wabash River watershed, which has a total drainage area of approximately 14.5 square miles. The Wabash Facility would be situated on the west side of the Wabash River, northwest of Terre Haute, Indiana. CO_2 injection well Site #1 and FM1 would be approximately 7 miles northwest of the Wabash Facility. CO_2 injection well Site #2 and FM2 would be approximately 3 miles west of the Wabash Facility.

Construction of the Project would result in ground disturbance across an area exceeding 1 acre. Therefore, construction stormwater discharges must be managed through development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) prepared in conformance with the Construction General Stormwater Permit administered by IDEM and the Erosion Control Permit administered by Vigo County. The SWPPP would include best management practices (BMPs) for each Project element to minimize erosion at the Wabash Facility, CO_2 injection well sites, and FM wells. Erosion control would be accomplished during construction using strategically placed erosion control devices, including, berms, swales, and culverts, to redirect runoff toward stormwater retention basins. Sandbags, filter bales, silt fences, and temporary dams would be installed as appropriate to minimize the volume of sediment carried by stormwater runoff and prevent the erosion of slopes and temporary drainage facilities.

During Project operations, stormwater that is exposed to industrial activity would require coverage under the Indiana Industrial Stormwater General Permit for runoff associated with industrial activities, pursuant to Indiana Administrative Code (IAC) (i.e., 327 IAC 15-6). The SWPPP for the existing gasification plant would be updated to serve as the SWPPP for operation of the Wabash Facility. Typical management practices would include the collection of stormwater from structures, access roads, and laydown yards/storage areas; collected stormwater would then be routed through a small settling basin. The stormwater would be retained or detained on-site in an infiltration basin to allow particulates to settle and the water to infiltrate into the ground. Excess water would be released off-site through overland flow or drainage swales, as defined in NPDES permit IN0063134, issued by IDEM to WVR on December 17, 2024, for all Project activities.

Industrial wastewater generated during operations would be discharged as outlined in the NPDES permit. The NPDES permit Outfall 001 discharge to the Wabash River, approximately 4.16 million gallons per day (mgd), would consist of distillate from the evaporator/brine

concentrator. The evaporator/brine concentrator would treat process wastewater from the petcoke/coal gasification process. Outfall 001 would also discharge cooling tower blowdown from gasification and ammonia production operations, microfiltration rack and reverse-osmosis concentrate from the intake water treatment system, treated sanitary wastewater from internal Outfall 202, and on-site stormwater. Prior to discharge from Outfall 001, wastewater and stormwater streams would comingle in a two-pond treatment system for aeration (for ammonia removal), sedimentation, pH neutralization, and dechlorination. Sanitary wastewater from internal Outfall 202 would pass through an activated sludge wastewater treatment plant with chlorine disinfection before entering the treatment pond system.

The two CO_2 injection well sites and the two FM well sites would not require a source of water. The water supply source for the Wabash Facility would be the Wabash River, using existing water intake structures/systems. The existing WRCGRDP site has a registered SWWF with the IDNR. The SWWF, as registered, consists of seven surface water intakes with a design capacity that would allow water to be withdrawn at a combined flow rate of 521,500 gpm (750 mgd). WVR has updated the existing SWWF registration to reflect greatly reduced use of the SWWF for the new Wabash Facility. During operation, reporting of actual SWWF usage, including monthly tabulations of the volume of water withdrawn at each intake, would be submitted to IDNR per applicable requirements.

The existing WRCGRDP site used a once-through cooling process for the steam cycle; water from the Wabash River was withdrawn through the registered SWWF. The Wabash Facility would withdraw water through the same registered SWWF to provide cooling water for all production facilities at the site. The addition of two multiple-cycle, non-contact cooling systems would reduce the quantity of water necessary to support operations versus the quantity of water consumed during operation of the former WRCGRDP facility. The raw water withdrawn from the Wabash River would first go through treatment for clarification. The water would then circulate in a closed loop from the cooling towers to heat exchangers (where cooling of process fluids is induced), then sent back to the cooling towers. The intake would withdraw approximately 5,500 gpm to provide make-up water to the cooling system and compensate for evaporative losses. The only discharge from the closed-loop cooling system would be a blowdown stream. Blowdown from both cooling towers would be discharged to aeration and settling ponds that would discharge to the Wabash River through Outfall 001, in compliance with the Wabash Facility's NPDES permit.

As is currently the case for the WRCGRDP site, potable water for the Project would be supplied form a municipal source by Indiana American Water.

3.3.3 Wetlands and Floodplains

Wetland/water body field surveys and delineations were conducted in June/July 2024 to identify and attempt to avoid or minimize impacts on regulated U.S. Army Corps of Engineers (USACE) environmental resources within the Project area. Prior to the field surveys/delineations, U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), soil surveys were reviewed to identify hydric soils in the Project area. One hydric soil series (Ragsdale silt loam, 0 to 2 percent slopes) and five soil series with hydric inclusions were identified. See the Natural Resources Assessment Report in Appendix E for a complete list of soil series identified within the Project area.

Prior to the field surveys/delineations, the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) and National Hydrography Dataset (NHD) were also reviewed to identify potential wetlands or streams within the Project area. USFWS NWI data suggested that six wetland features and 11 streams were potentially in the Project area.

A site survey was conducted in the summer of 2024 to identify the location of wetland and stream features within the Project area. Four wetland features were identified during the site survey. One wetland was a palustrine emergent (PEM)/palustrine scrub shrub (PSS)/palustrine forested (PFO) wetland, one was a PFO wetland, and two were PEM wetlands. In addition, four apparently isolated PEM wetlands were identified within the Project area. Thirteen ephemeral streams were identified as well as one intermittent stream. Two non-jurisdictional, manmade upland drainage features were also identified within the Project area. The Natural Resources Assessment Report located in Appendix E contains further descriptions of these features.

Coordination with USACE was initiated to establish a jurisdictional determination of wetlands and streams within the Project area. A request for an approved jurisdictional determination was submitted to USACE on September 25, 2024. USACE issued an approved jurisdictional determination (AJD) and preliminary jurisdictional determination (PJD) letter to WVR dated January 22, 2025. The AJD covered six features that were identified as jurisdictional waters of the United States and regulated under Section 404 of the Clean Water Act. These features are all at the Wabash Facility site. The PJD covered 18 features that were not considered to be waters of the United States and therefore not regulated under Section 404 of the Clean Water Act. A pre-construction notification for coverage under Nationwide Permit 39 (Commercial and Institutional Developments), as determined by USACE, would be submitted to USACE by WVR for impacts on features regulated under Section 404 of the Clean Water Act. Correspondence associated with USACE jurisdictional determinations and associated permitting are provided in Appendix B.

A request for a waters of the state determination was submitted to IDEM on February 4, 2025, to confirm which resources would qualify for an IDEM permitting exemption and which would require IDEM permitting. In the IDEM response dated April 21, 2025, IDEM concluded that the three wetlands on CO_2 injection well Site #1 are all exempt from IDEM permitting; no further IDEM permit is required for these wetlands. IDEM noted that the wetlands at the Wabash Facility that require USACE coverage under Section 404 of the Clean Water Act also require Section 401 water quality certification from IDEM. Coverage under Section 401 for wetlands at the Wabash Facility would be addressed in conjunction with the USACE Section 404 permitting process and submittal of the application for coverage under Nationwide Permit 39, as described above. Correspondence associated with IDEM waters of the state determinations and associated permitting are provided in Appendix B.

Project activity at the water intake would require dredging the accumulated sediment at the existing water intake valves in the Wabash River. This activity would be completed without a change in the elevation of the floodplain of the Wabash River. However, sediment removal would alter the Federal Emergency Management Agency's (FEMA's) 100-year Zone AE by increasing flood capacity with the volume of removed sediment. The dredging work would be completed under the approved NPDES permit; it is currently covered under an existing SWPPP from IDNR as an authorized maintenance activity. In accordance with the USACE NWP, the dredging would use land-based equipment, and sediment would be disposed of on-site in the area of the former Duke Energy coal storage area.

Maintenance activity at the water intake for the WRCGRDP site falls within FEMA's Zone AE, the 100-year floodplain of the Wabash River, on flood map 18167C0045C, dated February 18, 2011. The portion of the Wabash River at water intake does not contain FEMA-mapped regulatory floodway. The eastern edge of the LOD for the hydrogen production and CO_2 capture facilities follows the contours of the LOD for the WRCGRDP site and parallels the Wabash River; however, no other portion of the LOD for the hydrogen production and CO_2 capture facilities falls within a FEMA flood zone (see FEMA flood maps 18167C0045C and 18167C0043C, dated February 18, 2011). No other Project locations are in FEMA flood zones.

See the Figure 5 map set (A–F) of the Natural Resources Assessment Report in Appendix E for an illustration of the FEMA-mapped resources. WVR obtained approval for work at this site from USACE under Section 404 on March 13, 2025 (for maintenance activity at the water intake location under Nationwide Permit 3). On April 28, 2025, WVR also obtained a construction in floodway (CIF) permit from the IDNR Division of Water.

In consideration of EPA's issuance of the UIC permits, the BMPs to be used to minimize erosion, the cooling water reuse design for the Wabash Facility, and the adjustments to the Project footprint to minimize impacts on wetland/stream and floodplain resources, impacts on water resources would not be significant.

3.4 Air Quality

Air quality in Indiana is managed through a cooperative effort between EPA and IDEM. EPA sets National Ambient Air Quality Standards (NAAQS) to protect public health and welfare under the federal Clean Air Act (42 U.S.C. 85 7401–7671), while IDEM is responsible for implementing air quality programs, monitoring pollutant levels, and issuing permits to ensure compliance with the standards.

Geographic areas are classified under the Clean Air Act as either "attainment" or "nonattainment" areas for each criteria pollutant, based on whether the NAAQS have been achieved or not. Both Vigo and Vermillion Counties are designated as in attainment for all criteria pollutants: carbon monoxide (CO), ozone, sulfur dioxide (SO_2), nitrogen dioxide (NO_2), inhalable particulate matter 10 microns or less in diameter (PM_{10}), fine particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), and lead (Pb).

The General Conformity rule established under the Clean Air Act plays an important role in helping states improve air quality in areas that do not meet the NAAQS. General conformity ensures that the actions taken by federal agencies would not interfere with a state's plans to attain and maintain national standards for air quality. Under the General Conformity rule, federal agencies must work with the state in a nonattainment or maintenance area to ensure that federal actions conform to the air quality plans established in the applicable state or tribal implementation plan. Because the Project is in an area that is designated as in attainment or unclassified for all criteria pollutants, the General Conformity rule is not applicable.

In addition to the NAAQS, the federal Prevention of Significant Deterioration (PSD) program has been established to protect against air quality deterioration in those areas that already meet the NAAQS. Specifically, the PSD program establishes allowable-concentration increases for attainment pollutants due to the new emission sources that have been classified as major sources. These increases allow economic growth while preserving the existing air quality, protecting public health and welfare, and protecting Class I areas (e.g., national parks and wilderness areas).

The PSD regulations define a major stationary source as any source type, from a list of 28 source categories, that emits, or has the potential to emit, 100 tons per year or more of any pollutant regulated under the Clean Air Act or any other source type that has the potential to emit such pollutants in amounts equal to or greater than 250 tons per year. If a source is considered major for PSD purposes because of one pollutant, then PSD review is applicable for those other pollutants emitted from the source in amounts greater than the PSD significance emissions rates. The PSD regulations require major stationary sources to undergo a preconstruction review that includes analysis and implementation of best available control technology (BACT), a PSD increment consumption analysis, an ambient air quality effects analysis, and analysis of air quality–related values (i.e., effects on soils, visibility, and vegetation).

The EPA Risk Management Plan (RMP) regulations at 40 CFR 68 require facilities that use and hold more than a threshold quantity of regulated extremely hazardous substances to implement a risk management program and submit an RMP to EPA that identifies the potential effects of a chemical accident, identifies steps the facility would take to prevent an accident, and spells out emergency response procedures should an accident occur. Chemicals associated with the Project that are also on the RMP list of regulated substances and would be subject to RMP regulations include anhydrous ammonia and hydrogen. Both have a threshold quantity of 10,000 pounds.

The RMP regulations are broken into program levels, based on the potential for a release to have an impact on a facility and/or surrounding area. Level 1 applies to facilities that have not had a reportable release in the last 5 years and do not have the potential for an impact from a catastrophic release outside the boundaries of the facility. Level 2 applies to facilities that are neither Level 1 nor Level 3. Level 3 applies to those facilities that fall under the OSHA 29 CFR 1910.119 Process Safety Management regulations. Because the chemicals associated with the Project are regulated by OSHA, the Wabash Facility would be Level 3. Compliance would include meeting the requirements from 29 CFR 1910.119 as well as registering with the EPA RMP program, conducting a worst-case analysis study, and conducting an alternate-case study.

3.4.1 Air Quality during Construction

Air emissions from construction activities represent temporary, localized air quality impacts that typically are short in duration. The Project would require grading, excavation, and preparation of the construction areas at all Project locations (Wabash Facility, both CO_2 injection well sites, and both FM well sites), which would result in the generation of fugitive dust in the form of particulate matter (PM). Construction also would result in exhaust emissions from construction equipment such as dump trucks, scrapers, bulldozers, front-end loaders, cranes, welding equipment, and diesel generators.

Project construction is expected to last approximately 24 months. The measures that would be used to mitigate emissions during construction include common dust control practices, such as watering active grading areas and storage piles, ceasing grading in high winds, limiting vehicle speeds on unpaved roads, and preventing the track-out of dirt from unpaved areas to paved roadways. **Table 3.4-1** and **Table 3.4-2** provide conservative estimates of anticipated monthly peak-period construction emissions from combustion equipment and fugitive dust, respectively.

Table 3.4-1: Construction Equipment Diesel Combustion Emissions

Pollutant	Pounds/Day	Tons/Year
CO	131	24.0
Volatile organic compounds (VOCs)	10.6	2.4
Nitrogen oxides (NO_x)	141	25.2
Particulate matter ($PM/PM_{10}/PM_{2.5}$)	7.8	1.2
SO_2	0.1	0.01
CO_2	18,400	3,312

Table 3.4-2: Fugitive Construction Dust (tons/year)

	Acres	Total PM	PM_{10}	$PM_{2.5}$
Hydrogen production and CO_2 capture facilities	51.33	369.6	110.9	11.0
Ammonia synthesis facility	36.90	265.7	79.7	7.9
Laydown yard/parking area	17.66	127.2	38.2	3.8
CO_2 injection well Site #1	16.65	119.9	36.0	3.6
CO_2 injection well Site #2	11.41	82.2	24.6	2.5
FM1	4.45	32.0	9.6	1.0
FM2	4.81	34.7	10.4	1.1

Emissions from diesel equipment were calculated with use of a conservative estimate for the number of pieces of construction equipment, engine sizes, and associated average emissions factors, load factors, and hours of operation, as follows:

- Number of diesel engines for construction: 20 (estimated)
- Average diesel engine horsepower: 200 (typical per California Emissions Estimator Model ([CalEEMod])
- Average equipment load factor: 0.5 (typical per CalEEMod)
- Average hours/day use: 8 (typical)
- Average workdays/month: 30 (conservative)

Determinations of diesel equipment combustion emissions were based on a review of multiple potential sources of emissions data for road and non-road engine emissions. This included a review of test results for engines, emissions factors, and engine emission standards. Based on this review, a conservative emissions factor for each pollutant was determined, using the most conservative (highest) potentially relevant factor. **Table 3.4-3** shows each of the pollutant emissions factors used for this estimate and its basis.

Table 3.4-3: Average Emissions Factors for Heavy-Duty Diesel Vehicle and Construction Equipment

Pollutant	Factor (g/hp-hr)	Basis (most conservative from review of various sources)
CO	3.7	Tier 3 non-road diesel engines (2007 and later model years) from 100 to 750 horsepower (hp). **Source: DieselNet 2024**
VOC	0.30	Upper end of test results for construction equipment emissions in study by University of California, Riverside: *Evaluations of In-use Emissions Factors from Off-road Construction Equipment*. **Source: Cao et al. 2016**

Table 3.4-3: Average Emissions Factors for Heavy-Duty Diesel Vehicle and Construction Equipment

Pollutant	Factor (g/hp-hr)	Basis (most conservative from review of various sources)
NO_x	4.0	EPA heavy-duty on-road engine standard in 1998 (pre-controls). **Source: EPA 1997** Also, approximate upper end of test results for construction equipment in University of California, Riverside study referenced above. **Source: Cao et al. 2016**
Particulate matter (PM, PM_{10}, $PM_{2.5}$)	0.22	Tier 3 non-road diesel engines (2007 and later model years) from 100 to 175 hp. **Source: DieselNet 2024**
SO_2	0.0015	Use of ultra-low-sulfur diesel (15 parts per million), 0.6 gallon per hp-hr, 8.5 pounds per gallon density, 2 pounds SO_2 per pound of sulfur in fuel. **Source: EPA 2024b**
CO_2	521.6	EPA AP-42, Chapter 3.3, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines. **Source: EPA 2025a.**

g/hp-hr = grams per horsepower-hour; NO_X= oxides of nitrogen

Fugitive dust emissions during Project construction may temporarily affect air quality at the Project site and in the surrounding area; however, these impacts would be minor and temporary. Controls would be implemented to minimize fugitive dust emissions during construction, such as watering on an as-needed basis and implementing speed limits within the construction area.

3.4.2 Air Quality During Operations

The existing WRCGRDP facilities operated under Title V (Part 70), Operating Permit Renewal No. T167-39882-00091, issued by IDEM to WVR on February 26, 2019; it is currently permitted as a major stationary source under 326 IAC 2-2 with respect to emissions of SO_2, oxides of nitrogen (NO_X), and CO. The operational emissions of the Project were estimated as part of the Project air permit application. A PSD permit modification application was submitted to IDEM on March 10, 2022, for changes associated with the Project. Pursuant to the provisions of 326 IAC 2-7-10.5, Part 70 permits/source modifications, the PSD/significant source modification was approved by IDEM on January 11, 2024 (Appendix A). Permit applications, updates, and approvals from IDEM are available on the IDEM Air Quality Permit Status Search website (IDEM 2024b).

An update to the Title V permit for the existing WRCGRDP facilities was required because the proposed facility updates/modifications triggered PSD requirements for emissions of NO_X and GHGs/CO_2 (as carbon dioxide equivalents [CO_{2e}]). PSD requires Project emission sources to employ BACT to minimize emissions of PSD-subject pollutants. As such, the air permit application for the Project included an analysis that demonstrated that the proposed equipment and controls meet the PSD BACT requirement for NO_X and CO_2 emissions and represent the highest level of emissions control that is technically and economically reasonable. In addition, because the Project was subject to PSD requirements for NO_X emissions, the application included a dispersion modeling analysis to demonstrate that Project emissions would comply with the NAAQS and PSD requirements for NO_2. Modeling is not required by IDEM or EPA for CO_{2e} emissions.

Project air emissions are summarized in **Table 3.4-4**, which also shows the existing WRCGRDP facility emissions and total emissions with the Project. For reference, the significant emission rate thresholds are also included, showing that Project emissions were subject to PSD requirements for NO_X and GHG.

Table 3.4-4: Project Emissions (tons/year)

Pollutant	Potential Project (modification) Emissions Increase	PSD Significance Thresholds for the Project Modification[a]	Potential Existing WRCGRDP Facility Emissions	Total Emissions of Wabash Facility Following Project (with modification)
NO_X	47.17	40	141.73	188.90
CO	34.41	100	1,693.17	1,727.58
$PM_{2.5}$	3.44	10	14.65	18.09
PM_{10}	-0.24[b]	15	25.87	25.63
SO_2	0.39	40	1,054.00	1,054.39
VOC	6.07	40	7.84	13.91
Total combined HAPs	1.84	25	3.33	5.17
GHG[c]	76,674	75,000	74,680	151,354

[a] *Sources: EPA 2025b; IDEM 2025.*
[b] *Net emissions reduction associated with existing cooling tower, which is to be retired.*
[c] *As carbon dioxide equivalents (CO_2e).*
HAPs= hazardous air pollutants

Because the Project was subject to PSD requirements for NO_X emissions, the application included a dispersion modeling analysis to demonstrate compliance with the NAAQS and PSD requirements for NO_2. The modeling included Project emissions increases, WRCGRDP facility sources, and nearby background sources, in accordance with PSD requirements. Inclusion of an ambient background concentration, representing other background sources not explicitly modeled, was included for NAAQS modeling only and not PSD modeling, in accordance with PSD regulations. A summary of the NAAQS and PSD increment modeling results are provided in **Table 3.4-5** and **Table 3.4-6**, respectively. Details of the modeling methodology are provided in the modeling report that accompanied the March 2022 application submitted to IDEM (see footnote to **Table 3.4-5**). The modeling report includes a discussion of Project air emission sources; application of EPA's recommended dispersion model, AERMOD; source parameters and emission rates input to AERMOD; model options; meteorological data; and the results of air quality analyses. **Table 3.4-5** and **Table 3.4-6** present the model results for the Project, which demonstrate compliance with the NAAQS and PSD requirements. Although the results for 1-hour NO_2 are close to the NAAQS, it should be noted that the majority of the total concentration is not associated with Project emissions but due to the inclusion of nearby background sources in the modeling and an ambient background component, as discussed in the modeling report.

Table 3.4-5: NAAQS Modeling Results

Pollutant	Averaging Period	Total Modeled Concentration with Ambient Background ($\mu g/m^3$)[a]	NAAQS ($\mu g/m^3$)[b]	Percent of NAAQS
NO_2	1 hour	184.4	188	98.1%
	Annual	35.2	100	35.2%

[a] Modeling results presented here are without the "power block" portion of the Project, which, at this time, is no longer being proposed for construction. Refer to IDEM 2024b for the Title V air permit modification application submitted on January 11, 2024, which contains the modeling report (see page 1224 of 1244 for results table). Note that this application and modeling report include the power-block emission sources; however, results without the power block are the same for 1-hour NO_2 (184.4 micrograms per cubic meter [$\mu g/m^3$]), and the annual result with the power block is only somewhat higher at 35.6 $\mu g/m^3$ but still well below the NAAQS.
[b] Source: EPA 2025c.

Table 3.4-6: PSD Increment Modeling Results

Pollutant	Averaging Period	Total Modeled Concentration ($\mu g/m^3$)	PSD Increment ($\mu g/m^3$)[a]	Percent of PSD
NO_2	Annual	2.39	25	9.6%

Source: EPA 2025d.

Certain sensitive areas, defined as Class I areas under the Clean Air Act, have a smaller allowable incremental increase in new emissions than Class II and III areas. Areas such as international parks, national parks greater than 6,000 acres, national memorial parks larger than 5,000 acres, and national wilderness areas larger than 5,000 acres are granted Class I status and the highest level of air quality protections under Section 162(a) of the Clean Air Act. The closest Class I area relative to the Project site is Mammoth Cave National Park in Kentucky, approximately 170 miles from the facility. The modeling analysis submitted with the air permit application in March 2022 indicated that the Project would not have a significant impact on air quality at Mammoth Cave National Park. It was also demonstrated that potential Project impacts on air quality–related issues (i.e., effects on soils, visibility, and vegetation) were also within acceptable values.

Once the Project is operational, the Wabash Facility would capture 5,500 metric tonnes per day of CO_2 that would be transported by truck to two CO_2 injection well sites. Although each CO_2 injection well site would be capable of receiving the full production rate of CO_2 from the Wabash Facility, this analysis assumes an equal split would occur between the two CO_2 injection well sites. The selection of CO_2 transport routes from the Wabash Facility to the CO_2 injection well sites considered route length, road quality, and traffic impacts and avoided low-capacity bridges. A more detailed description of the transport routes is provided in Section 2 and Section 3.6.

WVR would transport CO_2 from the Wabash Facility to the two CO_2 injection well sites with use of hydrogen-powered trucks. Hydrogen fuel cells in trucks eliminates emissions of the criteria air pollutants that would normally be associated with trucking CO_2, with the exception of particulate emissions, which are associated primarily with tire and brake wear. The primary transport route to/from the Wabash Facility to CO_2 injection well Site #1 is approximately 30 miles round trip and approximately 11 miles round trip to/from CO_2 injection well Site #2. Emissions from the

trucks that would be operating along these routes were calculated using emission factors, in grams per vehicle mile traveled, derived from EPA's *Motor Vehicle Emission Simulator* (MOVES5) (EPA 2025e). MOVES5 is an emission modeling system that estimates emissions for mobile sources at national, county, and project levels for criteria air pollutants, GHGs, and hazardous air pollutants (HAPs), where applicable.

To calculate total vehicle miles traveled, it was assumed that there would be five round trips per hour per route and that trucks would operate 8,760 hours per year. The resultant annual mileage was multiplied by the MOVES-derived emission factors and converted to tons (**Table 3.4-7**). Although the Project site is in an area that has been designated as in attainment/unclassified for all criteria pollutants and general conformity is not applicable, the results of the annual transport route emissions analysis can be discussed in comparison with de minimis thresholds for general conformity, which are used to determine if a project requires a full conformity analysis. These thresholds range from 70 tons to 100 tons per year for PM_{10} and $PM_{2.5}$, based on the severity of the nonattainment status (40 CFR 93.153). As the combined total emissions in **Table 3.4-7** indicate, PM_{10} and $PM_{2.5}$ emissions from transporting CO_2 from the Wabash Facility to the CO_2 injection well sites would be well below de minimis thresholds, even if a general conformity review were applicable.

Table 3.4-7: CO_2 Transport Routes – Estimated Particulate Emissions

Pollutant	CO_2 Injection Well Site #1 (tons/year)	CO_2 Injection Well Site #2 (tons/year)	Combined Total (tons/year)
$PM_{2.5}$	0.6	0.3	1.0
PM_{10}	3.1	1.6	4.8

GHG emissions associated with life-cycle operation of the Project would be approximately 59 percent lower than emissions from the conventional steam methane reformation (SMR) ammonia manufacturing process. Project operations would generate average life-cycle GHG emissions of approximately 570,000 tons per year to produce ammonia compared to approximately 1,377,000 tons per year to produce the same amount of ammonia using conventional SMR. Project-related GHG calculations include emissions from the combustion and gasification of fuel as well as emissions associated with operation of the Project from electricity use, transportation, and raw material formulation, accounting for carbon capture in the gasification slag and sequestration of CO_2. The magnitude of the annual avoidance/reduction in GHG during ammonia production would depend on the amount of ammonia produced. On a comparative basis, the gasification and sequestration process has a carbon intensity of approximately 1.05 kilograms of CO_2e per kilogram of ammonia compared conventional SMR, with a rate of 2.55 kilograms of CO_2e per kilogram ammonia (Liu et al. 2020).

Because the Project site would be within an attainment area, and considering existing air quality conditions, projected emissions, and the emission controls to be implemented during construction and operation, the Project would not have significant impacts on air quality.

3.5 Noise

Noise is generally defined as sound that is loud, disagreeable, unexpected, or unwanted. Whether something is perceived as noise is influenced by the type of sound, the duration, the perceived importance of the sound and its appropriateness in the setting, the time of day, the type of activity during which the noise occurs, and the sensitivity of the listener. Sound levels

are measured in decibels using a logarithmic scale (see Table 3.5-1). To quantify noise effects on people, a weighting system is applied to the sound, reflecting the typical frequency-dependent sensitivity of average healthy human hearing. This adjustment is called "A-weighting," and the measured decibel level is referred to as A-weighted decibels, or dBA.

Table 3.5-1: General Noise Table

Decibel Level	General Description and Reference Noise Source
10 to 30	Breathing, whisper, rustling leaves, quiet rural area
30 to 50	Library, bird calls, quiet suburb, conversation at home
60	Conversation in a restaurant, background music, office (half as loud as 70 dB)
70	Vacuum cleaner, music or TV audio
80	Garbage disposal, food blender (2 times as loud as 70 dB)
90	Power mower, motorcycle at 25 feet (4 times as loud as 70 dB)
100	Garbage truck, jack hammer, farm tractor, motorcycle

3.5.1 Regulations and Guidelines (Federal, State, and County)

EPA guidance (EPA 1974) addresses issues of community noise. The guidance contains recommended goals for sound exposure levels that affect residential land uses. The recommended day-night sound level (L_{dn}) is less than or equal to 55 dBA at exterior locations, which is equivalent to a continuous noise level of 48.6 dBA, equivalent continuous sound level (L_{eq}). The EPA guidance-based threshold level of 55 dBA L_{dn} at exterior locations was used to assess and evaluate the potential Project-related noise impacts.

The State of Indiana has a general noise ordinance, 2024 Indiana Code Title 13, Environment, Article 17, Air Pollution Control, Chapter 3, Powers and Duties Concerning Air Pollution Control, 13-17-3-15, Rules and Standards Limiting Noise Emission (IN Code Section13-17-3-15 [2024]); however, the ordinance does not provide noise level thresholds.

Vigo and Vermillion Counties have various ordinances related to noise (e.g., Vigo County, Chapter 53, Excessive Noise, Disturbance Prohibited; Chapter 20, Road Crossings – Temporary Road Closing; and Vermillion County Unified Development Ordinance, Article 5.23 G, Noise Pollution) (Vermillion County 2025) that may be applicable to noise associated with construction and operation of the Project (e.g., noise from the Wabash Facility, CO_2 injection well sites, FM well sites, and/or the route for transporting CO_2 from the Wabash Facility to the CO_2 injection well locations).

3.5.2 General Noise Setting

Noise-sensitive receptors are generally defined as areas where there is a reasonable degree of sensitivity to noise. These areas include residences, residential areas, hospitals, schools, churches, libraries, sensitive-species habitat, and other areas where quiet is an important attribute of the environment. The components of and activities associated with the Project are in Vigo County, including the Wabash Facility, one CO_2 injection well site, one FM well site, and the route for transporting CO_2 from the Wabash Facility to the Vigo County CO_2 injection well location, and Vermillion County, including one CO_2 injection well site, one FM well site, and the route for transporting CO_2 from the Wabash Facility to the Vermillion County CO_2 injection well location. The Wabash Facility is in an industrial area (the former WRCGRDP), and the injection and FM wells are in rural agricultural/residential areas (see **Figure 2.1 A-G**).

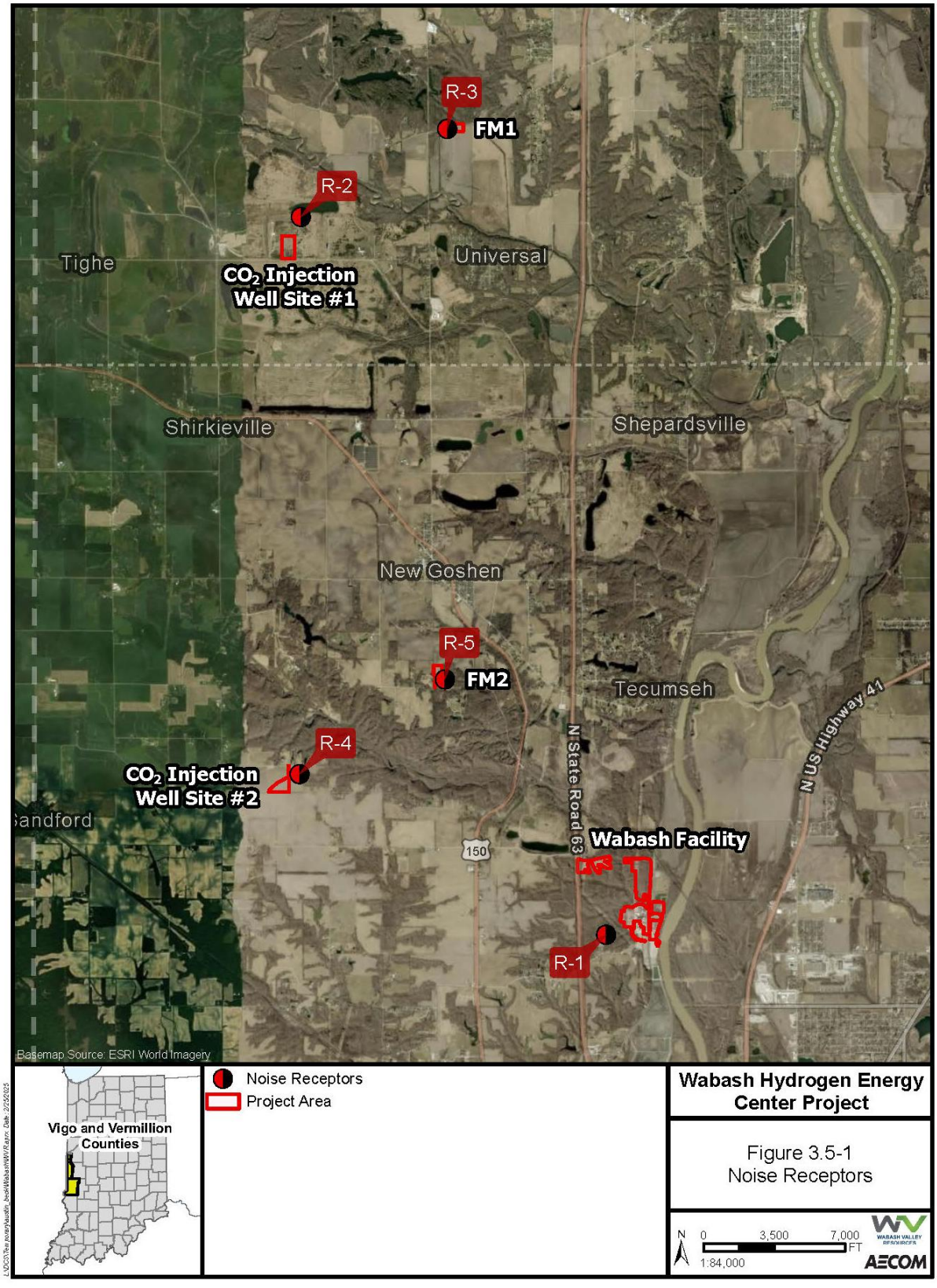
The noise-sensitive receptors in the vicinity of the Wabash Facility include several residences to the southwest along Bolton Road. The nearest noise-sensitive receptor along Bolton Road is a single-family home that is approximately 1,640 feet southwest from the center of the hydrogen production and CO_2 capture facilities and approximately 3,800 feet southwest from the center of the ammonia synthesis facility. The nearest noise-sensitive receptor to CO_2 injection well Site #1 is a residence approximately 1,425 feet to the northeast along County Road 1800 in Vermillion County, west of Universal, Indiana; two residences are within 1,500 feet of CO_2 injection well Site #1. The nearest noise-sensitive receptor to the FM1 site is a rural residence approximately 600 feet to the west along East Hazel Bluff Road in Vermillion County; three residences are within 1,500 feet of FM1. The nearest noise-sensitive receptor to CO_2 injection well Site #2 is a residence approximately 590 feet to the east along North Reiter Place in rural Vigo County; five residences are within 1,500 feet of CO_2 injection well Site #2. The nearest noise-sensitive receptor to the FM2 site is a rural residence approximately 460 feet to the southwest along West Haymaker Avenue in Vigo County; 11 residences are within 1,500 feet of FM2. Table 3.5-2 presents the coordinates for each noise-sensitive receptor location shown in **Figure 3.5-1** and the distance from each receptor to the Project.

Table 3.5-2: Distances to Project Site from Noise-Sensitive Receptors

Site ID	Latitude	Longitude	Approximate Distance from Project Component (feet)	Nearest Project Component
R-1	39º31'48.5" N	87º25'53.6" W	1,640	Hydrogen production and CO_2 capture facilities
R-1	39º31'48.5" N	87º25'53.6" W	3,800	Ammonia synthesis facility
R-2	39º37'39.3" N	87º29'8.3" W	1,425	CO_2 injection well Site #1
R-3	39º38'22.8" N	87º27'36.0" W	600	FM1
R-4	39º33'6.5" N	87º29'7.6" W	590	CO_2 injection well Site #2
R-5	39º33'53.2" N	87º27'36.0" W	460	FM2

In addition to the noise-sensitive receptors in the vicinity of the stationary Project components, there are 229 noise-sensitive receptors, primarily rural and semi-rural single-family residences, within 500 feet of the Vigo County and Vermillion County CO_2 trucking routes. Of the 229 noise-sensitive receptors, 202 are associated with the route to CO_2 injection well Site #1 and 28 are associated with the route to CO_2 injection well Site #2 (one receptor is associated with both routes).

Figure 3.5-1: Noise Receptors



3.5.3 Construction Noise

The primary sources of noise associated with construction of the Project that would affect nearby noise-sensitive receptors include:

- Construction and refurbishment of infrastructure at the Wabash Facility (i.e., the new hydrogen production and CO_2 capture facilities and the new ammonia synthesis facility).
- Construction of the two CO_2 injection wells and the off-site FM wells.

As provided in Chapter 2, the construction period for the Wabash Facility would last up to 36 months; construction of each CO_2 injection well site and the off-site FM well sites would require 54 days of continuous construction (24 hours a day, 7 days a week). The majority of the construction activities at the Wabash Facility would occur during the day. Longer workdays may be necessary to make up for construction schedule delays or complete critical construction activities on time. During the start-up and testing phase of the Wabash Facility, some activities may continue 24 hours a day, 7 days a week.

The noise levels associated with construction of the Wabash Facility, CO_2 injection well sites, and the FM well sites have been conservatively assumed to be 85 dBA at a distance of 50 feet from the noise source (Federal Highway Administration [FHWA] 2006). The expected noise levels associated with construction of the Project at the nearest noise-sensitive receptor to each Project component are presented in **Table 3.5-3.**

Table 3.5-3: Construction Noise Levels at Noise-Sensitive Receptors

Receptor ID	Description of Receptor	Approximate Distance from Project Component (feet)	Nearest Project Component	Sound Level from Construction (dBA)*
R-1	Residence	1,640	Hydrogen production and CO_2 capture facilities	55
R-1	Residence	3,800	Ammonia synthesis facility	47
R-2	Residence	1,425	CO_2 injection well Site #1	56
R-3	Residence	600	FM1	63
R-4	Residence	590	CO_2 injection well Site #2	64
R-5	Residence	460	FM2	66
Other	Residence	1,500	Any component	55

**Noise attenuation values were calculated for sound traveling through the air; they did not account for any physical, topographical, or natural features that may be present. If present, such features may attenuate (reduce) the estimated sound levels at a receptor—see https://www.omnicalculator.com/physics/distance-attenuation.*

Noise associated with construction of the Wabash Facility (e.g., the new hydrogen production and CO_2 capture facilities and the new ammonia synthesis facility) would be equal to or less than the EPA-recommended day-night sound level (i.e., less than or equal to 55 dBA) at exterior locations at the nearest noise-sensitive receptor (R-1). Noise associated with construction of the CO_2 injection wells and FM wells would exceed the EPA-recommended day-night sound level (i.e., less than or equal to 55 dBA) at exterior locations at the nearest noise-sensitive receptors (R-2 through R-5) as well as the 17 other noise-sensitive receptors within 1,500 feet of the

construction sites that would be active 24 hours a day, 7 days a week for the duration of the 54-day construction period.

WVR has committed to consulting with Vermillion and Vigo Counties, as well as State of Indiana authorities, and would review and address any noise-related issues (see Appendix G). Based on consultation, WVR would implement applicable measures (e.g., install noise curtains or other noise attenuation barriers) to adhere to applicable regulatory standards or ordinances related to noise levels. Because of the commitment made by WVR to consult with local and state authorities and the implementation of applicable measures to adhere to applicable regulatory standards and ordinances, which may include collecting additional reference sound-level data to refine the predictive model and allow tailored noise-control measures, the noise-related construction impacts would not be significant.

3.5.4 Operational Noise

The primary sources of noise associated with the operation of the Project that would affect nearby noise-sensitive receptors include:

- Equipment noise generated within the gasification plant, including the new hydrogen production and CO_2 capture facilities at the Wabash Facility (approximately 107 dBA at the source and 85 dBA at 50 feet from the source).
- Equipment noise generated within the new ammonia synthesis facility, including the ammonia reactor and cooling tower at the Wabash Facility (approximately 107 dBA at the source and 85 dBA at 50 feet from the source).
- Operation of the railyard at the Wabash Facility (approximately 85 dBA at 50 feet from locomotives and train movements, with short bursts (impulse noise) accounting for 95 dBA at 50 feet due to the coupling and uncoupling of railcars).
- Operational trucking of CO_2 from the Wabash Facility to the CO_2 injection well sites.
- Equipment noise generated from the CO_2 injection well sites (e.g., unloading operations at an eight-bay CO_2 truck unloading area, refrigeration compressors, heat exchangers, fans, valves, motors, pumps) (approximately 86 dBA at the source and 62 dBA at 50 feet from the source).

Operational noise associated with employees traveling to and from the Wabash Facility and the CO_2 injection well sites would not notably alter the existing noise environment, and there are no noise-sensitive receptors along the access road (West Sandford Avenue) from State Road 63 to the Wabash Facility. In addition, no notable noise would be generated from operation of the FM wells.

Table 3.5-4 lists the expected noise levels at the nearest noise-sensitive receptors due to cumulative noise generated by all operational equipment at the respective Project site.

Table 3.5-4: Operational Noise Levels at Noise-Sensitive Receptors

Receptor ID	Description of Receptor	Approximate Distance from Project Component (feet)	Nearest Project Component	Sound Level from Operations (dBA)*
R-1	Residence	1,640	Hydrogen production and CO_2 capture facilities	52

Table 3.5-4: Operational Noise Levels at Noise-Sensitive Receptors

Receptor ID	Description of Receptor	Approximate Distance from Project Component (feet)	Nearest Project Component	Sound Level from Operations (dBA)*
		3,800	Ammonia synthesis facility	46
		1,640/3,800	Combined facilities	53
R-1	Residence	1,640 3,800	Railyard (impulse [coupling/uncoupling])	65 57
R-2	Residence	1,425	CO_2 injection well Site #1	33
R-4	Residence	1,020	CO_2 injection well Site #2	41

**Noise attenuation values were calculated for sound traveling through the air; they did not account for any physical, topographical, or natural features that may be present. If present, such features may attenuate (reduce) the estimated sound levels at a receptor—see https://www.omnicalculator.com/physics/distance-attenuation.*

The noise associated with operation of the Wabash Facility (e.g., the new hydrogen production and CO_2 capture facilities, new ammonia synthesis facility, railyard) would be within the EPA-recommended day-night sound level of less than or equal to 55 dBA at exterior locations at the nearest noise-sensitive receptor (R-1), with the exception of certain intermittent railyard operations (e.g., coupling and uncoupling of rail cars). Railyard operations specific to the coupling and uncoupling of railcars would occur during daylight hours. The noise associated with operation of the CO_2 injection wells and FM wells would not exceed the EPA-recommended day-night sound level of less than or equal to 55 dBA at exterior locations at the nearest noise-sensitive receptors (R-2 and R-4).

The Wabash Facility and the CO_2 injection well locations would be subject to OSHA requirements for the respective operational workforce at each location. OSHA standards stipulate that protection against the effects of noise exposure shall be provided for employees when sound levels exceed 90 dBA over an 8-hour exposure period or noise exposure equals or exceeds the action level of an 8-hour, time-weighted average sound level of 85 dBA. WVR would implement applicable and feasible administrative and engineering controls and/or require personal protective equipment (PPE) in accordance with OSHA standards to protect the operational workforce from excessive noise exposure.

Noise from the operational trucking of CO_2 from the Wabash Facility to the CO_2 injection well sites would come from heavy-duty trucks transporting liquid CO_2. WVR would employ a fleet of hydrogen fuel cell trucks to support trucking operations. At full speed on highways (e.g., State Road 63), hydrogen fuel cell trucks generate a noise level equivalent to that of trucks with internal-combustion engines (80 to 90 dBA at a distance of 50 feet) because road noise (i.e., from tires) rather than engine noise is the primary source of sound. However, at lower speeds, such as operations on transport routes along county roads and through rural neighborhoods, hydrogen fuel cell trucks generate lower noise levels (70 dBA at a distance of 50 feet) than trucks with diesel internal-combustion engines (90 dBA at a distance of 50 feet) due to being driven by an electric motor.

As provided in **Chapter 2**, the northern route to/from CO_2 injection well Site #1, approximately 30 miles round trip, follows two slightly different courses for supply versus return to the CO_2 loading area at the Wabash Facility. The southern route to/from CO_2 injection well Site #2,

approximately 11 miles round trip, follows a loop until the outgoing and return routes converge on Sandford Avenue before continuing back to the CO_2 loading area at the Wabash Facility. It is anticipated that there would be approximately four or five round trips each hour to each CO_2 injection well site. These operations would occur 24 hours a day, 7 days a week. For residences fronting roadways with both inbound and outbound CO_2 injection well site traffic (i.e., portions of Sandford Avenue and State Road 63), there would be up to 10 truck pass-by events per hour (i.e., five trucks/hour x two-directional distribution). This would equate to an average of approximately one truck passing a location every 6 minutes 24 hours a day, 7 days a week.

LPO recognizes that the FHWA Traffic Noise Model (TNM) is industry-standard software for modeling transportation noise along highways; therefore, the entire route was evaluated using TNM software. TNM is designed to predict traffic noise. It accounts for various factors that influence noise levels, including vehicle speed, volume, and composition. Although TNM does incorporate vehicle operating modes (e.g., variations in speed), the primary methodology for calculating noise levels is generally based on cruise conditions. TNM can model variations in speed; however, it does not explicitly model the transient noise spikes associated with stopping and starting. TNM's strength lies in predicting cumulative noise exposure over time from a continuous flow of traffic rather than instantaneous peaks from individual vehicle maneuvers. As such, TNM provides noise values that are time-averaged values, representing the equivalent continuous sound level over a full 24-hour period as a single value that summarizes the cumulative noise exposure over an entire day and night, not an instantaneous or peak noise measurement.

To account for stopping and starting events, which can generate noise levels of up 70 dBA at a distance of 50 feet, LPO completed point-source modeling to account for stopping and starting events associated with intersections, stopping for oncoming traffic, and slowing or stopping to navigate limited turning radii on rural roads. Point-source modeling assesses traffic noise according to a snapshot in time (e.g., noise associated with stopping and starting at an intersection occurring every 20 minutes 24 hours a day) and predicts the maximum noise level that would be received from a singular truck pass-by event. In this condition, the source would behave as a moving point source and thereby attenuate at a rate of approximately 6 dB per doubling of distance from the truck. LPO used the point-source calculations to model noise from a single vehicle, which is the dominant noise contributor relative to the receiver, and provide the instantaneous noise level (in dBA) associated with stopping and starting events along the transportation route.

Table 3.5-5 provides the operational trucking noise levels calculated by LPO using the OmniCalculator.com tool. Sound levels presented in the table represent instantaneous (momentary) sound levels from truck operations that would be experienced at homes along the rural roadways where trucks may start and stop at intersections or traffic control devices due to oncoming traffic or navigate limited turning radii. Because trucks would not start and stop along State Road 63, the instantaneous noise modeling results are not applicable along those segments. **Table 3.5-6** provides the operational trucking noise levels calculated with the TNM software. The time-averaged sound presented in the table represents the equivalent continuous sound level over a full 24-hour period as a single value that summarizes the cumulative noise exposure over an entire day and night.

Table 3.5-5: Instantaneous Operational Trucking Noise Levels at Noise-Sensitive Receptors

Description of Receptor	Approximate Distance (feet) from Trucking Route	Nearest Project Component	Sound Level from Truck Operations (instantaneous dBA)*
Residence	50 feet (non-highway)	Hydrogen fuel cell truck	70 dBA
	150 feet (non-highway)	Hydrogen fuel cell truck	60 dBA
	300 feet (non-highway)	Hydrogen fuel cell truck	54 dBA

**Instantaneous noise attenuation values (dBA) were calculated for sound traveling through the air; they did not account for any physical, topographical, or natural features that may be present. If present, such features may attenuate (reduce) the estimated sound levels at a receptor—see https://www.omnicalculator.com/physics/distance-attenuation.*

Table 3.5-6: Daily Operational Trucking Noise Exposure Calculated Using FHWA TNM

Description of Receptor	Approximate Distance (feet) from Trucking Route	Nearest Project Component	Sound Level from Truck Operations (24-hour day-night noise level dBA, L_{dn})*
Residence	Within 500 feet along northern route (non-highway)	Hydrogen fuel cell truck	39–54 dBA, L_{dn}*
Residence	Within 500 feet along southern route (non-highway)	Hydrogen fuel cell truck	38–51 dBA, L_{dn}*
Residence	Within 500 feet along State Road 63 (highway)	Hydrogen fuel cell truck	41–48 dBA, L_{dn}*

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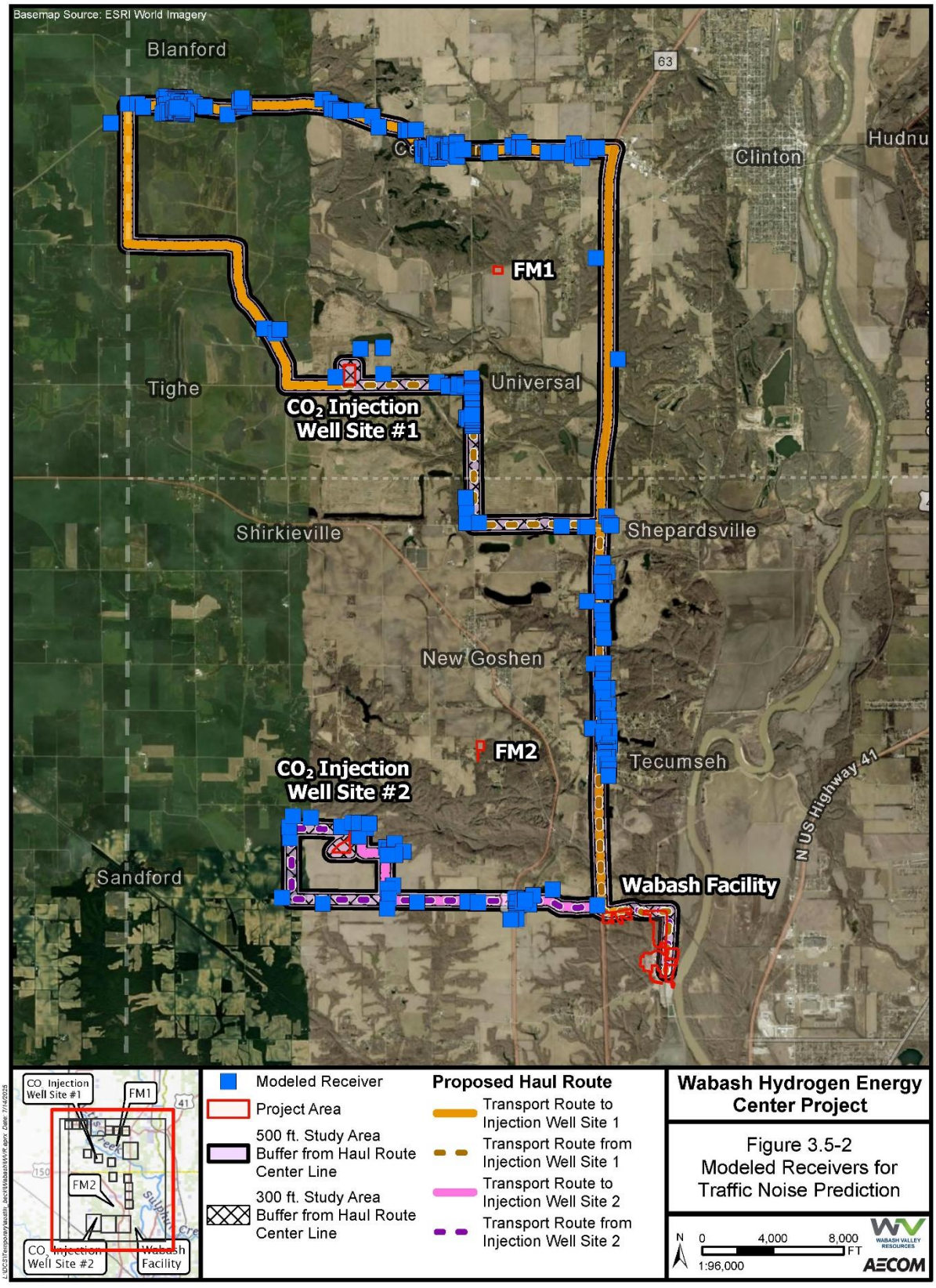
As presented in **Table 3.5-5** and in **Figure 3.5-2**, noise-sensitive receptors within 300 feet of the non-highway transportation route to CO_2 injection well Site #1 and CO_2 injection well Site #2 would be exposed to instantaneous noise levels above 55 dBA at exterior locations. Noise-sensitive receptors beyond 300 feet of the non-highway transportation route would not be exposed to noise levels above 55 dBA. As presented in **Table 3.5-6,** no noise-sensitive receptors along the transportation route to CO_2 injection well Site #1 and CO_2 injection well Site #2 would be exposed to a 24-hour day-night noise level that would exceed 55 dBA, L_{dn}.

Figure 3.5-2: Modeled Receivers for Traffic Noise Prediction



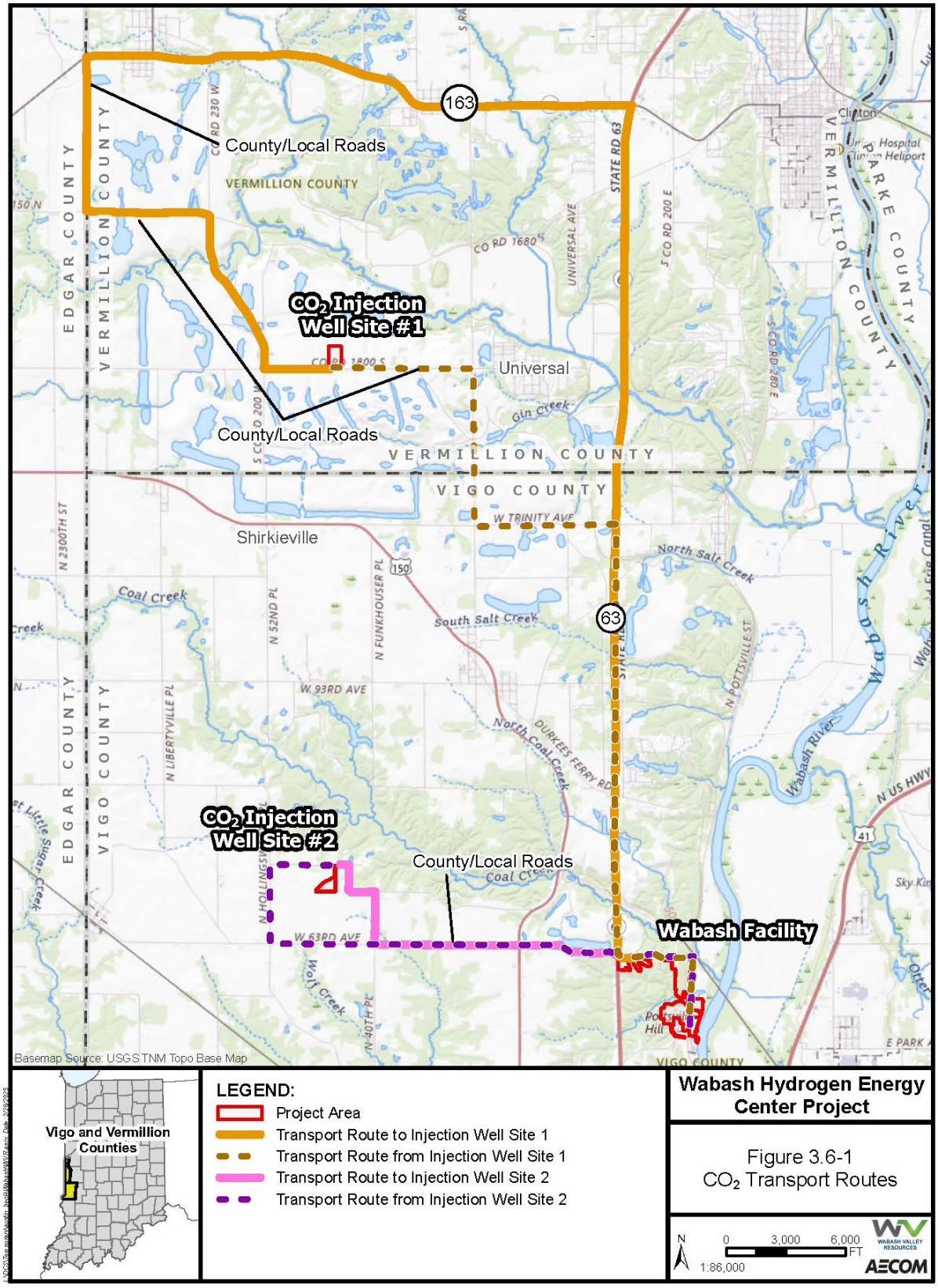
WVR has committed to consulting with Vermillion and Vigo Counties, as well as State of Indiana authorities, and would review and address any noise-related issues (see Appendix G). Given these consultations, WVR would implement applicable measures (e.g., install noise attenuation barriers along transportation routes, provide modifications to residences, modify truck operating schedules) to adhere to applicable regulatory standards or ordinances related to noise levels. Because of the commitment made by WVR to consult with local and state authorities, as well as commitments to implement applicable measures and adhere to applicable regulatory standards and ordinances, which may include collecting additional reference sound-level data to refine the predictive model and allow tailored noise-control measures, noise-related construction and operational impacts would not be significant.

3.6 Transportation

The Wabash Facility is on the west bank of the Wabash River, approximately 3 miles northwest of Terre Haute, Indiana. Access to the Wabash Facility is from West Sandford Avenue, a two-lane paved county road that intersects State Road 63, a four-lane divided highway. Access to State Road 63 from West Sandford Avenue is controlled by a stop sign with no turn lanes. State Road 63 provides access to Interstate 70, approximately 9 miles south of the Wabash Facility. In addition, the Wabash Facility has a railyard with a rail spur to The Indiana Rail Road. Currently, no rail operations serve the Wabash Facility.

The transportation routes from the Wabash Facility to the two injection well sites are presented in Section 2.2 and **Figure 3.6-1**. CO_2 injection well Site #1 is approximately 8 miles northwest of the Wabash Facility and accessed from Vermillion County Road 1800 South, a gravel road. CO_2 injection well Site #2 is approximately 4 miles west of the Wabash Facility and accessed from Wright Avenue, a two-lane paved road in Vigo County. FM Well #1 is accessed from East Hazel Bluff Road, a road in Vermillion County. FM Well #2 is accessed from West Haymaker Avenue, a paved road in Vigo County.

Figure 3.6-1: CO_2 Transport Routes



The U.S. Department of Transportation (U.S. DOT) measures transportation movement or level of service (LOS) to describe the quality of motor vehicle operations along roadways and at intersections. The U.S. DOT LOS ratings consider traffic flow by assigning quality levels to traffic, based on performance measures like vehicle speed, density, congestion, and other factors. U.S. DOT LOS ratings consist of ratings A through F, with A representing a free flow and F representing a forced or breakdown flow.

- LOS A: Free flow. Traffic flows at or above the posted speed limit and motorists have complete mobility between lanes.
- LOS B: Reasonably free flow. LOS A speeds are maintained but maneuverability within the traffic stream is slightly restricted.
- LOS C: Stable flow, at or near free flow. The ability to maneuver through lanes is noticeably restricted and lane changes require more driver awareness. This is the target LOS for some urban and most rural highways.
- LOS D: Approaching unstable flow. Speeds slightly decrease as traffic volume slightly increases. Freedom to maneuver within the traffic stream is much more limited and driver comfort levels decrease.
- LOS E: Unstable flow, operating at capacity. Flow becomes irregular and speed varies rapidly because there are virtually no usable gaps to maneuver in the traffic stream and speeds rarely reach the posted limit.
- LOS F: Forced or breakdown flow. Every vehicle moves in lockstep with the vehicle in front of it, with frequent slowing required. Travel time cannot be predicted, with generally more demand than capacity. A road with a constant traffic jam is at this LOS because LOS is the average or typical service rather than a constant state.

Typically, most design or planning efforts use service flow rates of LOS C or D to ensure acceptable service for facility users.

To assess road maintenance associated with road use (i.e., passenger vehicles and commercial trucks) on paved roads, transportation officials use equivalent single-axle load (ESAL) calculations. ESAL is a concept developed from data collected as part of the American Association of State Highway and Transportation Officials (AASHTO) road test to establish a damage relationship for comparing the effects of axles carrying different loads. A typical passenger vehicle (i.e., a 4,000-pound car) has an ESAL of 0.0004, while an 80,000-pound five-axle semi-truck has an ESAL of 2.45 (equivalent to 6,125 passenger cars).

WVR has performed the following initial evaluations associated with increased traffic and the supply and delivery activities due to construction and operation of the Project (see Appendix F):

- Carbon Capture Project Traffic Analysis, Thrive West Central, July 2024, provides preliminary ESAL calculations for just CO_2 transport by a five-axle semi-truck on paved roads.
- Draft Haul Vehicle Route Turning Analysis, Banning Engineering, Inc., September 2024, provides a review of trucks (i.e., a 68.5-foot-long, five-axle semi-truck and a large 38-foot-long truck) navigating the intersections and turns along a revised northern CO_2 haul route as well as the southern CO_2 haul route.

- Traffic Engineering Analysis, State Road 63 at Sandford Avenue, West Terre Haute, Indiana, Traffic Engineering, Inc., October 9, 2024, provides a traffic analysis associated with additional CO_2 truck and ammonia truck movements.
- Level-of-Service Analysis, State Road 63 at Sandford Avenue, West Terre Haute, Indiana, Traffic Engineering, Inc., October 9, 2024, provides an LOS analysis associated with additional CO_2 truck and ammonia truck movements (appendix to the traffic engineering analysis report).
- Traffic Signal Warrant Analysis, State Road 63 at Sandford Avenue, West Terre Haute, Indiana, Traffic Engineering, Inc., October 9, 2024, provides a traffic signal analysis associated with the additional CO_2 truck and ammonia truck movements (appendix to the traffic engineering analysis report).

3.6.1 Construction

During construction, up to 455 workers daily and 40 delivery vehicles (i.e., trucks and other construction vehicles) would enter and exit the Wabash Facility via the West Sandford Avenue intersection at State Road 63. The majority of the construction workforce would arrive at the Wabash Facility between 7 and 9 a.m. and depart between 4 and 6 p.m. each day. Designed parking areas would be established in developed areas to support construction activities occurring during that time. Construction staging areas at the Wabash Facility and along West Sandford Avenue would be used to store and stage various materials and supplies throughout the construction period. During construction, the Wabash Facility would receive a limited number of deliveries by rail (e.g., heavy vessels). Rail transport is expected to be limited to two or three individual loads over the duration of construction.

Construction at each injection well site would require up to 20 workers over a 24-hour period (i.e., 10 workers per 12-hour shift). Setup and demobilization at an injection well site would require 10 loads of equipment (e.g., the drilling rig and associated equipment) on semi-trucks over a 3-day period. Additional material deliveries would be delivered by semi-trucks to the injection well sites two or three times per week. The trucks that could access the injection well sites for construction setup, deliveries, and demobilization would be limited to semi-trucks up to 68.5 feet long at CO_2 injection well Site #1 and large trucks up to 38 feet long at CO_2 injection well Site #2 (see the haul vehicle route turning analysis in Appendix F).

Once the drill rig is erected and the drilling activities begin, the site would be staffed with a maximum of 20 workers on an around-the-clock basis (i.e., 10 workers per shift). It is expected that the workers would share vehicles while commuting to the construction site, thereby limiting the number of light vehicles arriving and leaving each day. At the cessation of drilling activities, the drilling rig would be disassembled and removed from site, resulting in 10 loads leaving over the course of 2 or 3 days.

WVR completed road use ESAL calculations for the paved roads and a traffic study at the intersection of West Sandford Avenue and State Road 63. The traffic study reviewed the increase in truck traffic associated with ammonia deliveries and CO_2 transport; the review did not account for other routing deliveries or workforce commuting during construction or operation. Due to the limited duration of construction and relatively limited truck traffic during the construction period compared with operation of the Wabash Facility, an ESAL was not calculated for construction. The traffic analysis found that the current LOS at the West Sandford Avenue and State Road 63 intersection (2024) is LOS A for the northbound and southbound travel lanes and turn lanes on State Road 63 and LOS D for both the eastbound and westbound traffic on West Sandford Avenue.

3.6.2 Operation

During operations, the Wabash Facility would have up to 250 personnel on staff and contractors. This means that up to 125 employees would access the facility during two 12-hour shifts 7 days a week. In addition, 35 contracted employees would work an 8-hour shift 5 days a week, and 90 employees would support CO_2 trucking services 7 days a week. The injection wells and FM well locations would not have a permanent on-site staff.

WVR completed road use ESAL calculations for the paved roads and a traffic study at the intersection of West Sandford Avenue and State Road 63. The traffic study reviewed the increase in truck traffic associated with ammonia deliveries and CO_2 transport.[1] The traffic analysis found that current LOS at the West Sandford Avenue and State Road 63 intersection (2024) is LOS A for the northbound and southbound travel lanes and turn lanes on State Road 63 and LOS D for both the eastbound and westbound traffic on West Sandford Avenue.

The Wabash Facility operational workforce would access the Wabash Facility via West Sandford Avenue at the intersection with State Road 63. The majority of the operational workforce (up to 160 employees) would arrive at the Wabash Facility between 7 and 9 a.m. and depart between 4 and 6 p.m. each day. Designed parking areas would be established to support employee access to their respective work areas. In addition to the daily employee workforce, various contractors and visitors, delivery trucks, CO_2 transport trucks, and ammonia transport trucks would access the Wabash Facility, as presented in **Table 3.6.1**

Table 3.6-1: Daily Project Operation Traffic – Sandford Avenue

Traffic Type	Historical	New	Total
Employees/contractors	60	250	250
Contractor/visitor vehicles	16	20	36
Other delivery trucks	6	624	630
CO_2 transport trucks, Vigo County (round trip)	NA	120	120
CO_2 transport trucks, Vermillion County (round trip)	NA	120	120
Sixteen-hour shift, ammonia product transport trucks	NA	144	144

In addition to on-road transportation during operation, petcoke and coal would be delivered to the Wabash Facility by rail. On average, 2.5 deliveries of feedstock, using 70-car trains (3,500 to 4,550 feet long), would arrive each week. Railcars would arrive at the on-site railyard, unload at the feedstock storage yard, and then be dispatched from the Wabash Facility. Any railcar loads of sulfur would be dispatched with the empty outgoing petcoke railcars.

The traffic analysis found that the current (2024) LOS at the West Sandford Avenue and State Road 63 intersection is LOS A for the northbound and southbound travel lanes and turn lanes on State Road 63 and up to LOS D for both the eastbound and westbound traffic on West Sandford Avenue. The forecast (2029) LOS at the West Sandford Avenue and State Road 63 intersection (with consideration of only the CO_2 transport trucks and ammonia product transport

[1] For ammonia, 72 trucks would be loaded per day over a 16-hour period, for an average of nine trucks per hour turning in and out of West Sandford Avenue. For CO_2 transport, 240 trucks would be loaded per day over a 24-hour period, for an average of 10 trucks per hour turning in and out of West Sandford Avenue.

trucks) remains at LOS A for the northbound and southbound travel lanes, drops to LOS B for turn lanes on State Road 63, and drops to LOS F for both the eastbound and westbound traffic on West Sanford Road.

As presented in the Carbon Capture Project Traffic Analysis (see Appendix F), operation of the CO_2 transport trucks amounts to 107,310 ESALs (i.e., 365 operating days per year at a rate of 120 loaded trips per day at 2.45 ESALs per truck). LPO notes that the ESAL calculation does not account for ammonia product shipments (144 daily shipments) or the other delivery shipments (630 daily shipments) to the Wabash Facility.

WVR has committed to consulting with Vermillion and Vigo Counties, as well as the Indiana Department of Transportation, to develop and implement a transportation and maintenance plan that addresses potential congestion, LOS degradation, delays, safety risks, and road maintenance issues (see Appendix G). Uncontrolled intersections along State Road 63 (e.g., at West Sandford Avenue) present specific safety risks where movements from side roads are controlled by stop signs. Without reliable traffic control measures, such as traffic signals, drivers may encounter challenges when crossing four lanes of traffic, particularly during peak travel times. In addition, WVR has committed $5 million to implementing transportation improvement and maintenance measures associated with the transportation plan. Because of the commitments made by WVR and development and implementation of a transportation and maintenance plan in consultation with local and state authorities, the operational impacts associated with transportation would not be significant.

3.7 Visual Resources

Visual resources include public viewsheds and scenic resources, including state scenic highways and rivers. Effects on visual resources can result from alterations to the landscape, changes to the environment surrounding sensitive areas, or an increase in light pollution. The following characterization of the landscape and identification of key viewpoints (KVPs) is based on aerial imagery and consultation with applicable planning documents.

Federal regulations require visual impacts to be addressed for Section 106 resources (36 CFR Part 800). As discussed in Section 3.2, an architectural history survey was conducted in which 19 properties were assessed for their significance in meeting the criteria for listing in the NRHP. The survey concluded that none of the properties possess sufficient integrity or significance for listing in the NRHP. There are no specific federal or state visual regulatory requirements that apply to properties that are not designated historic and/or eligible for listing in the NRHP or parkland.

The Vigo County Comprehensive Plan outlines the future visions for the county and outlines a plan to obtain that vision through implementation of the Vigo County Unified Zoning Ordinance and Subdivision and Flood Control Ordinance. The Vigo County Comprehensive Plan outlines buffering between industrial and non-industrial uses and mitigation when the uses are adjacent without buffer. The Unified Zoning Ordinance for Vigo County regulates visual barriers and the use of buffer yards as a mechanism to create a barrier between dissimilar abutting zoning districts. As discussed in Section 3.13, Project sites in Vigo County are zoned M-2 Heavy Industrial (Wabash Facility) and A-1 Agricultural (CO_2 injection well Site #2 and FM2).

The Vermillion County Area Plan Commission has developed maps that identify various zoning areas throughout the county. CO_2 injection well Site #1 and associated FM1 are in Zone A-1, General Agricultural, which generally permits a variety of agricultural uses, such as crop production, forestry, land conservation, orchards, plant nurseries, the raising of farm animals, tree farms, and vineyards, along with single-family residences. The Vermillion County Unified

Development Ordinance (Vermillion County 2025) does not regulate injection or monitoring wells or appurtenant facilities in Zone A-1.

3.7.1 Viewsheds

The viewshed for visual resources is defined as the area encompassing locations from which a project would be visible. The distance from which the Wabash Facility, CO_2 injection well sites, and FM sites would be visible would depend on local topography, weather conditions, presence of intervening structures, and the height of proposed and existing structures.

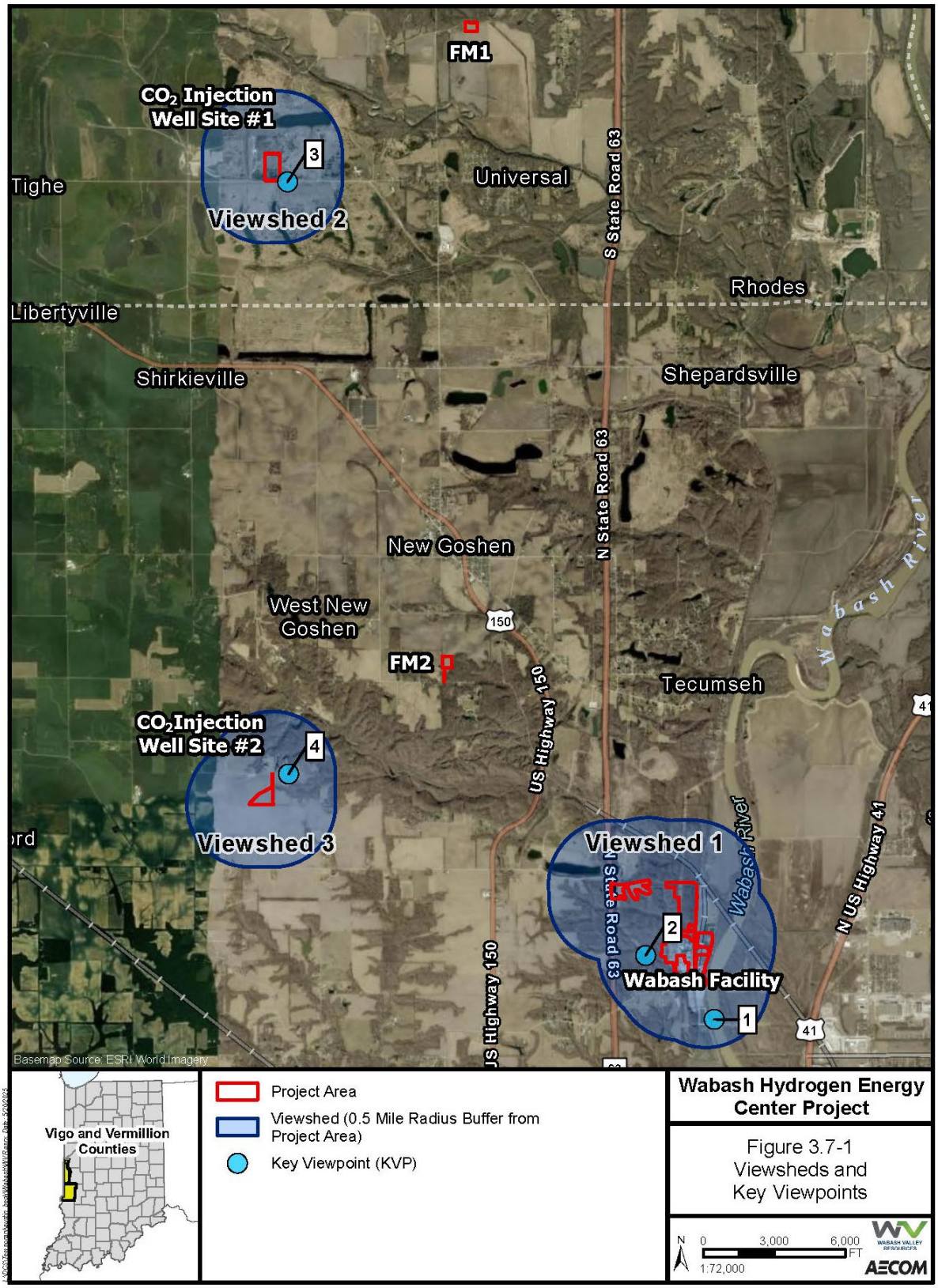
There are three main areas where development of infrastructure associated with the Project could alter existing visual quality; therefore, three larger viewsheds have been identified for this analysis. Each of the three viewsheds extends 0.5 mile from the proposed infrastructure. The viewsheds used for this analysis, as well as their associated KVPs, are shown in **Figure 3.7-1** and described below.

- Viewshed 1: Surrounding the Wabash Facility
- Viewshed 2: Northern CO_2 injection well Site #1 in Vermillion County
- Viewshed 3: Southern CO_2 injection well Site #2 in Vigo County

The two FM well sites are outside of the viewsheds for the CO_2 injection well sites. Infrastructure associated with the two FM sites is not anticipated to be above 8 feet tall and therefore would not change the existing visual landscape. A large (e.g., 0.5-mile) viewshed analysis is not applicable for the two FM sites.

Viewshed 1 includes a radius of approximately 0.5 mile around the Wabash Facility, which is on the Wabash River. The components of the Wabash Facility include the hydrogen production and CO_2 capture facilities, the ammonia synthesis facility, and the construction laydown yard/parking area. Viewshed 1 is a predominantly industrial land use but with forested natural areas, all of which is zoned as M-2 Heavy Industrial. Cleared utility corridors travel from the existing WRCGRDP to the north, west, south, and east across the river. Scattered single-family homes are located along Bolton Road, which is south of the existing WRCGRDP. The Wabash River – Vigo County Northern Conservation Area is on the east bank of the river. This conservation area provides access to hunting, trapping, fishing, hiking, and boating to the general public. The existing WRCGRDP is prominent in views from the Wabash River (KVP #1). In addition, Pottsville Hill (KVP #2) is west of the existing WRCGRDP. Pottsville Hill is approximately 590 feet above sea level, while the location for the proposed facility is between 450 and 575 feet above sea level.

Figure 3.7-1: Viewsheds and Key Viewpoints



Within Viewshed 1, the existing visual quality of the area is moderately low. Views within this viewshed are dominated by forested areas mixed with contrasting industrial infrastructure from the existing WRCGRDP and overhead transmission lines. The contrast of these elements has been a part of existing views for more than 20 years. Viewers would include primarily neighbors living along Bolton Road, close to the south end of the existing WRCGRDP, and recreational travelers on the Wabash River.

Bolton Road facing Wabash Facility

Viewshed 2 includes the proposed northern CO_2 injection well Site #1 in Vermillion County along County Road 1800 South. Viewshed 2 consists of wooded areas, cultivated fields, open natural areas, and scattered buildings (residential dwellings and agricultural structures). Few single-family homes are present within the viewshed. The area within Vermillion County is zoned A-1 General Agricultural and includes scattered residences (KVP #3). Existing views within the viewshed primarily are undeveloped wooded areas and open space (KVP #3). Within Viewshed 2, the existing visual quality of the area is moderate. There are no scenic resources, and the characteristics of the landscape are common throughout the area. Views of natural or agricultural areas are somewhat void of contrasting elements, including industrial uses. Viewers would include neighbors who live in the surrounding area.

CO_2 injection well Site #1

Viewshed 3 includes the southern CO_2 injection well Site #2 in Vigo County. Similar to Viewshed 2, the area is characterized predominately by agricultural and natural landscapes, although there is a greater distribution of single-family residences. A heavily forested area surrounding Coal Creek is north of CO_2 injection well Site #2. Within Vigo County, the area is currently zoned as A-1 Agricultural. As in Viewshed 2, the existing visual quality of the area is moderate. The characteristics of the landscape are common throughout the area, and views are typically void of contrasting industrial elements. Viewers would include neighbors who live in the vicinity.

CO_2 injection well Site #2

3.7.2 Viewshed Analysis

The Project would include upgrading and expanding the WRCGRDP site to develop the hydrogen production and CO_2 capture facilities and add the new ammonia synthesis facility directly north of the existing coal gasification facilities. The ammonia synthesis facility would include several small buildings on-site. The tallest features, the ammonia tower and flare tower, would be approximately 125 feet tall. In addition, a temporary laydown yard/parking area is proposed north of the site along West Sandford Avenue, east of State Road 63.

Within Viewshed 1, views of the new structures at the hydrogen production and CO_2 capture facilities and ammonia synthesis facility would very likely be visible from the Wabash River (KVP

#1) and Pottsville Hill (KVP #2). During the winter months, when surrounding trees have shed foliage, views of the structures may be more visible from various vantage points within the viewshed and for viewers on Bolton Road. Although vegetation immediately surrounding the ammonia synthesis facility site would be removed, a dense forest would remain around the perimeter, and viewers are accustomed to the industrial nature of land uses in the viewshed. Generally, viewer response in this area would be low because the character of the existing visual elements of the area would remain the same. Some residential viewers may experience more exposure or have higher sensitivity to the visual changes at the Wabash Facility. Visual changes in the viewshed would be low to moderate for portions that are elevated and on undeveloped parcels of the existing WRCGRDP site. The laydown yard/parking area would not involve the removal of trees. Although the presence of construction equipment and associated activities would introduce temporary visual changes to the landscape during the construction phase, these impacts would be transient. Upon completion of construction, the laydown yard/parking area would be returned to its original state as a natural open space, effectively mitigating the temporary visual intrusion caused by construction activities. Overall, visual impacts for Viewshed 1 would be low.

Within Viewshed 2, views of the Project site would include the infrastructure associated with CO_2 injection well Site #1. The permanent buildings on-site would be approximately 15 feet tall and add blocky elements to the otherwise natural landscape. Within Viewshed 2, viewer response and visual changes in this area would be moderate to high due to the introduction of industrial buildings and elements in areas surrounding residential homes, agricultural fields, and open spaces. The topography surrounding the sites is relatively flat and includes few trees, if any, to provide a visual barrier; therefore, the structures would be a prominent visual intrusion. Short-term temporary impacts would also occur during construction due to use of an approximately 120-foot drilling rig. Overall, visual impacts for Viewshed 2 surrounding CO_2 injection well Site #1 would be moderate to high.

Within Viewshed 3, views of the Project site would include the infrastructure associated with CO_2 injection well Site #2. The same infrastructure described for Viewshed 2 would be constructed at this location. Similarly, the permanent buildings on-site for CO_2 injection well Site #2 would add blocky elements to the otherwise natural landscape. Viewer response and visual changes in this area would be moderate to high due to the introduction of industrial buildings and elements in a residential and agricultural area. Short-term temporary impacts would also occur during construction due to use of an approximately 120-foot drilling rig. Overall, the visual impacts for Viewshed 3 surrounding CO_2 injection well Site #2 would be moderate to high.

Infrastructure associated with the two FM well sites would include wellheads and a small marshaling cabinet for electronics. Structures and cabinets are not anticipated to be above 8 feet tall. The FM1 well site is proposed in an open field adjacent to a residential dwelling. A small wooded area, approximately 250 feet in diameter, separates the structure from the open field. During winter months, when foliage has fallen, the site may be slightly visible. The FM2 well site is in an open agricultural field and surrounded by mature tree growth. Views of the site would be screened from surrounding residential dwellings. During construction, short-term temporary impacts would occur due to use of an approximately 120-foot drilling rig. However, permanent visual changes and viewer response due to the FM1 and FM2 structures would be low.

Security fencing around construction areas that are visible from roads and residences would help to minimize the overall temporary visual impact of the construction sites or equipment by screening views. After completion of construction, the Project sites would be landscaped with consideration of aesthetic views from surrounding land uses. Landscaping would include

managed turf grass around the hydrogen production and CO_2 capture facilities and ammonia synthesis facility in Viewshed 1. At the CO_2 injection well sites in Viewsheds 2 and 3, fencing and strategic plantings would be used to provide a visual screen and limit visual impacts. To ensure consistent visual screening throughout all seasons, the landscaping plan would incorporate evergreen vegetation that is native to the Project area. The native evergreen plantings would maintain their foliage year-round, effectively creating a continuous visual barrier. Finally, directing lighting downward would prevent light spill and minimize the nighttime visibility of the structures in the rural environment.

Visual impacts following implementation of the landscaping, design, and lighting mitigation measures would be considered moderate. Visual impacts surrounding the Wabash Facility, the CO_2 injection well sites, and the FM well sites would remain low after implementation of the mitigation measures. Therefore, impacts on aesthetic and visual resources as a result of the Project would not be significant.

3.8 Biological Resources and Threatened and Endangered Species

The hydrogen production and CO_2 capture facilities would be located on already-disturbed land that is currently in use for industrial purposes. A portion of land proposed for the cooling tower consists of previously disturbed land with the early successional regrowth of the surrounding forest. These wooded and partially wooded areas have limited ecological value compared with the surrounding, more mature forest. The ammonia synthesis facility would be located in an area that is currently wooded. This area is likely to have a higher ecological value compared with the disturbed site. This wooded area has the potential to provide forage, cover, and habitat for wildlife. Birds and terrestrial wildlife may be moderately affected on a temporary basis by removal of the forested area. The surrounding area is also wooded; however, it is anticipated that wildlife that use the affected forested area would move to the adjacent wooded areas. The CO_2 injection well sites and FM well sites are located in agricultural fields; therefore, the Project would have limited to no impact on local wildlife and endangered, threatened, or special-concern species.

Consultation with USFWS and IDNR has been completed. See Appendix A and Appendix B for a summary of necessary approvals and correspondence with these agencies, including the April 29, 2025, species concurrence email from USFWS in Appendix B.

3.8.1 Vegetation/Land Cover

The hydrogen production and CO_2 capture facilities would be located within the boundaries of the existing WRCGRDP industrial plant; therefore, the majority of land is considered developed or barren land. The ammonia synthesis facility would be situated in a forested area and an existing cleared pipeline right-of-way. The majority of the vegetation/land cover for the laydown yard/parking area, the two CO_2 injection well sites, and the two FM well sites is currently used for cultivated crops, hay production, or pastureland (see Section 3.13 for details regarding zoning and current land uses). **Table 3.8-1** provides a summary of the acreage for the various vegetation cover types by Project site, the percent each type represents for that site, and the percent of the total Project area.

Table 3.8-1: Vegetation Cover by Project Site

Vegetation/Land Cover Type	Acres	Percent of Site	Percent of Total Project Area
Hydrogen Production and CO_2 Capture Facilities			
Barren land (rock/sand/clay)	10.92	21.28	7.63
Developed, high intensity	14.62	28.48	10.21
Developed, medium intensity	11.77	22.94	8.22
Developed, low intensity	1.86	3.62	1.30
Pasture/hay	0.09	0.17	0.06
Deciduous forest	3.38	6.29	2.36
Mixed forest	0.25	0.48	0.17
Grassland/herbaceous	2.45	4.77	1.71
Open water[a]	2.40	4.67	1.67
Emergent herbaceous wetlands	3.58	6.98	2.50
Ammonia Synthesis Facility			
Developed, medium intensity	0.14	0.39	0.10
Developed, low intensity	1.10	2.98	0.77
Developed, open space	3.53	9.56	2.46
Pasture/hay	0.24	0.65	0.17
Deciduous forest	26.53	71.9	18.53
Mixed forest	3.09	8.37	2.16
Grassland/herbaceous	2.27	6.16	1.59
Parking yard/laydown area[b]			
Cultivated crops	14.94	84.58	10.43
Deciduous forest	2.72	15.42	1.90
CO_2 Injection Well Site #1[b]			
Pasture/hay	16.65	100.00	11.63
FM1			
Developed, open space	0.31	7.04	0.22
Cultivated crops	4.13	92.96	2.89
CO_2 Injection Well Site #2			
Developed, low intensity	< 0.01	0.02	0.00
Developed, open space	0.11	0.96	0.08
Cultivated crops	10.98	96.26	7.67
Pasture/hay	0.31	2.76	0.22

Table 3.8-1: Vegetation Cover by Project Site

Vegetation/Land Cover Type	Acres	Percent of Site	Percent of Total Project Area
FM2			
Developed, open space	0.01	0.14	< 0.01
Cultivated crops	4.57	94.90	3.19
Deciduous forest	0.24	4.96	0.17

Note: All values based on GIS data from USGS National Land Cover Database.
[a.] Open water in the area consists of the existing on-site manmade settling ponds.
[b.] USGS values at this location modified to reflect actual conditions at site assessed by aerial imagery (GoogleEarth) and during on-site biological field surveys.

3.8.1.1 Forest Management Areas

No officially identified state forests are located in Vigo County. Turkey Run State Park and Shades State Park are both located in Parke County, approximately 25 miles and 35 miles, respectively, from the closest Project site.

3.8.1.2 Nature Preserves

Indiana DNR identified one managed land area within 0.5 mile of the Wabash Facility. The Healthy Rivers Initiative (HRI) Wabash River Conservation Area is across the Wabash River, southeast of the farthest southeast corner of the Wabash Facility. This is one of three conservation areas for recreational use that has been identified by the HRI as part of the larger Wabash River and Sugar Creek Conservation Areas, which begin along the tributary creek at Shades State Park (approximately 35 miles northeast of the Wabash Facility) and run south-southwest across Montgomery, Parke, Vermillion, and Vigo Counties, ending at Fairbanks Landing Fish and Wildlife Area, approximately 25 miles southwest of the Wabash Facility. The HRI Wabash River Conservation Area provides hunting, trapping, fishing, and other recreational activities for the general public (IDNR 2025).

3.8.1.3 Sensitive/Special-Status Species

USFWS and IDNR list a number of federal and state rare, threatened, and endangered species as possibly being present within the Project area. See Appendix B6 and Appendix B7 for more detailed information.

3.8.2 Federally Listed Plants and Wildlife

The USFWS informal consultation process with DOE was concluded through correspondence from DOE to USFWS dated April 7, 2025, along with the USFWS concluding correspondence dated April 29, 2025. Copies of correspondence with USFWS regarding Section 7 consultation can be found in Appendix B.

Based on an Information for Planning and Consultation (IPaC) list dated March 4, 2025, the April 7, 2025, letter from DOE to USFWS identified six federally listed species that may be present in the Project area: the endangered gray bat (*Myotis grisescens*), the endangered Indiana bat (*Myotis sodalis*), endangered northern long-eared bat (*Myotis septentrionalis*), the experimental non-essential population of whooping crane (*Grus americana*), the proposed threatened monarch butterfly (*Danaus plexippus*), and the proposed threatened western regal

fritillary (*Argynnis idalia occientalis*). DOE also assessed northern long-eared bat and tricolored bat with use of the IPaC determination key (DKey). Based on the species assessment for each of the six species (see April 7, 2025, correspondence in Appendix B), DOE reached the following conclusions for the Project: "no effect" on the gray bat and western regal fritillary, "not likely to jeopardize the continued existence" of the whooping crane and monarch butterfly, and "may affect, not likely to adversely affect" the Indiana bat and northern long-eared bat.

The USFWS April 29, 2025, final consultation response letter noted:

- There may be suitable summer habitat for the federally endangered Indiana bat and northern long-eared bat throughout the Project sites.
- The majority of the Project sites containing forested habitats are outside of the area of influence for northern long-eared bat.
- The Project is within the range for the proposed federally threatened monarch butterfly.

In the final consultation letter, USFWS also determined that, based on WVR's "commitment to remove trees during the inactive season (October 1–March 31) for Indiana and northern long-eared bat," USFWS "would concur that the Project is not likely to adversely affect any federally listed Indiana bat and northern long eared bat and would not jeopardize the proposed monarch butterfly." No further consultation on this Project is required under Section 7 unless new information arises pertaining to Project plans or a revised species list is published. A formal memorandum of understanding with USFWS is not required.

On March 4, 2025, IPaC indicated that there are no critical habitats within the Project area that are under USFWS jurisdiction but the bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) may be in the vicinity. The golden eagle is listed as having a probability of presence in the Project area during the last two weeks of the month of January; it does not have a breeding season in the area. The bald eagle is listed as having a probability of presence and breeding year-round. In addition, numerous migratory birds were listed as having a probability of presence and/or breeding throughout various portions of the year.

USFWS Nationwide Standard Conservation Measures would be followed during construction to reduce impacts on migratory birds and their habitat (USFWS 2025). All general, habitat protection, and stressor management measures, as outlined in the most recent document at the time of construction, would be adhered to. This may include, but not be limited to:

- Preconstruction training for all individuals who have access to the worksite
- Scheduling vegetation removal outside of the peak bird breeding season
- Not collecting any part of wildlife without a permit and reporting incidental take of species to the local service office of law enforcement; if the need for a permit is identified before construction begins, it would be obtained at the time of construction—if and when wildlife that needs to be collected is identified and before collecting any part of that wildlife
- Conducting surveys a minimum of 5 days prior to construction in areas that require vegetation removal;
- Establishing the appropriate buffer distance from a nest and erecting a barrier around the nest should an occupied nest be encountered
- Preventing the introduction of invasive plant species into the worksite by using weed abatement measures, planting native species, using a vehicle wash station, and removing invasive species that pose an attractive nuisance to migratory birds

- Preventing an increase in lighting within native habitats during the bird breeding season by minimizing artificial lighting, instituting daily timing restrictions on such artificial lighting, and using lighting that is not bright white, such as metal halide, halogen, fluorescent, mercury vapor, and incandescent lamps
- Minimizing collision risks for birds by increasing the visibility of Project infrastructure and installing wildlife-friendly culverts under roads, where appropriate, to reduce dead prey along roadways, which, in turn, would reduce raptor deaths;
- Preventing the entrapment of birds in Project structures or their perching and nesting in Project locations that may endanger them by using anti-perching devices; covering nesting surfaces with mesh netting, fencing, or similar exclusion material; and monitoring potential nesting surfaces during peak breeding season
- Preventing an increase in noise above ambient levels during nesting bird season by installing temporary structural barriers and avoiding permanent additions to ambient noise levels through the use of baffle boxes or sound walls
- Preventing chemical contamination by implementing a hazardous materials plan (Section 3.11), avoiding soil contamination by using drip pans, minimizing use of equipment in natural aquatic and wetland systems, and using only pesticides or rodenticides that comply with applicable federal and state laws
- Minimizing fire potential by reducing fire hazards from vehicular and human activities and revegetating disturbed soil with low-growing, sparse, and fire-resistance native species approved by the Vigo County and Vermilion County Fire Departments and local USFWS office, as appropriate:
  - Vigo County Fire Department can be contacted at Sugar Creek Fire Department, 3801 North Arms Place, West Terre Haute, IN 47885, +1 (812) 535-3808
  - Vermillion County Fire Department can be contacted at Black Diamond Fire Department, 501 West Washington Street, Clinton, IN 47842, +1 (765) 832-1686

On March 4, 2025, IPaC also indicated that freshwater emergent wetlands and riverine habitat may be present within the Project area. Actual field-delineated wetland and stream data may be found in the Natural Resources Assessment Report (Appendix E), as discussed in Section 3.3.

3.8.3 State-Listed and Sensitive State Plants and Wildlife

On August 20, 2024, a request for Project review was submitted to the IDNR Division of Fish and Wildlife. A request for additional information was received on August 21, 2024. Additional information was returned to the IDNR on August 21, 2024. IDNR responded on September 19, 2024, with an early coordination/environmental assessment letter. Copies of correspondence with IDNR regarding potential impacts on state-listed species can be found in Appendix B.

The IDNR early coordination/environmental assessment letter noted that the Natural Heritage Database documented four state endangered and one state special-concern bird species within 0.5 mile of the Project area. Habitat assessments for these five species include:

- Barn owl (*Tyto alba*) is a state endangered species. It needs large areas with pastures, hayfields, grasslands, or wet meadows for hunting prey. Barn owls originally nested and roosted in hollow trees but now use barns, steeples, grain elevators, abandoned buildings, and other human-made structures. No nest building takes place, except for the occasional use of owl pellets as a base for eggs. The breeding season is from March to June.

- Henslow's sparrow (*Centronyx henslowii*) is a state endangered species. It lives and breeds in tall grasslands, meadows, and fallow fields, often in low-lying or damp areas with few trees, if any, or shrubs, feeding on seeds, insects, and fruits. Henslow's sparrow is an uncommon migrant and summer resident statewide; it is a very rare winter resident in the southern part of the state. Spring migration begins in mid-April. Fall migrants start to leave in mid-October. This species winters in the pine forests of the Gulf Coast states.
- Trumpeter swan (*Cygnus buccinator*) is a state endangered species. it is a statewide migrant and winter resident in the state. Trumpeter swan can be found at lakes, ponds, large rivers, marshes, and grain fields. They eat aquatic plants and seeds and feed by tipping their body into the water and immersing the upper portion or just the head and neck.
- Upland sandpiper (*Bartramia longicauda*) is a state endangered species. It is an uncommon migrant and summer resident throughout the state. Upland sandpiper lives in prairies, pastures, hayfields, red clover fields, fallow fields, and grasslands adjacent to airfields. Spring migrants begin arriving in early to mid-April. Eggs are produced from mid-May through June.
- Northern bobwhite (*Colinus virginianus*) is a state special concern species. It is a common permanent resident statewide. Northern bobwhite lives in orchards, fence rows, hayfields, grassy fields, and pastures. Eggs are produced in May and June. The nest is built in a depression on the ground and lined with grasses.

IDNR does not anticipate any significant impacts on the barn owl, trumpeter swan, or upland sandpiper due to the Project but noted that the Project area does provide suitable habitat for the listed Henslow's sparrow, northern bobwhite, and other threatened and endangered species. It was also noted that migratory bird and raptor winter concentration areas would be affected by the loss of habitat; however, direct impacts on these populations, or nests or chicks, is not expected. IDNR provided a list of recommendations for voluntary avoidance and minimization of impacts on state species and botanical resources (Appendix B). These recommendations would be taken into consideration during design, construction, and operation, together with the other measures discussed for federally listed species (Section 3.8.2), other permit requirements, pre-construction migratory bird nest surveys, and raptor nest avoidance buffers for active raptor nests.

Because Project design and construction would incorporate the avoidance and minimization recommendations of USFWS and IDNR, impacts on biological resources and threatened and endangered species resulting from the Project would not be significant.

3.9 Socioeconomics

The Wabash Facility, CO_2 injection well Site #2, and FM2 would be located in Vigo County, Indiana, northwest of the county's largest city, Terre Haute. CO_2 injection well Site #1 and FM1 would be located in southern Vermillion County, approximately 3 miles north of its border with Vigo County.

As shown in **Table 3.9-1**, the estimated population in Vigo County in July 2024 was 106,166 (U.S. Census Bureau 2025), which is 1.6 percent lower than its 2010 population of 107,848. Over that same 14-year period, Indiana's total population increased by 6.8 percent, from 6,483,802 in 2010 to 6,924,275 in July 2024 (U.S. Census Bureau 2025). Vigo County's residents consist mostly of White Alone individuals (87.7 percent), which is slightly higher than the statewide average of 83.7 percent. In Vermillion County, the estimated total population in July 2024 was 15,516 (U.S. Census Bureau 2025), which is 0.4 percent lower than its 2010

population of 16,212. Vermillion County's residents also consist of mostly White Alone individuals (96.8 percent), a much higher percentage than either Vigo County or the state.

Table 3.9-1: Population, Ethnicity, and Poverty

Location	Total Population – April 2020	Estimated Total Population – July 2024	White Alone Only (Non-Hispanic)	Households below Poverty Line (percent of all households)
State of Indiana	6,785,528	6,924,275	83.7%	12.3
Vigo County	*106,153*	*106,166*	*87.7%*	*20.2*
Vermillion County	*15,439*	*15,516*	*96.8%*	*12.5*

Source: U.S. Census Bureau 2025.

The Project locations are all in rural areas and sparsely populated. In Vigo County, an estimated 149 people live within 1 mile of the Wabash Facility; another 168 people reside within 1 mile of CO_2 injection well Site #2 (EPA 2024c). Together, these residents account for less than 0.3 percent of Vigo County's population. CO_2 injection well Site #1 in Vermillion County has an estimated 60 residents within 1 mile (EPA 2024c), which represents less than 0.4 percent of Vermillion County's 2024 population (U.S. Census Bureau 2025).

Although the FM sites also are in rural areas, they are both less than 1 mile from the edge of towns (FM1 is approximately 0.90 mile north of Universal, and FM2 is approximately 0.75 mile south of New Goshen); therefore, the populations within 1 mile of each of these FM sites is higher, with 307 people within 1 mile of FM1 and 428 people within 1 mile of FM2 (EPA 2024c). However, impacts on the populations around FM1 and FM2 would be short term and temporary, lasting approximately 51 days as the well at each site is constructed. Impacts during operations would be minimal because the facilities at the FM sites would consist of a low-profile wellhead and a small control shed. The only daily operational activity associated with the FM wells would be a visit to the FM well sites to ensure no irregular conditions and a secure environment.

In 2024, the resident labor force in Vigo County totaled 49,168, with an annual unemployment rate of 4.4 percent, slightly higher than the 4.2 percent statewide unemployment rate (StatsIndiana 2025). The median household income between 2019 and 2023 averaged $52,525 in Vigo County and $59,363 in Vermillion County, which is considerably lower than the statewide median household income of $70,051 (U.S. Census Bureau 2025). The percentage of the Vigo County population living below the poverty line in 2024 was 20.2 percent, which was greater than the statewide percentage of 12.3 percent (U.S. Census Bureau 2025). The percentage of the Vermillion County population living below the poverty line in 2024 was slightly higher than but comparable to the statewide percentage of 12.5 percent (U.S. Census Bureau 2025). In July 2024, there were approximately 46,910 housing units in Vigo County and approximately 7,374 housing units in Vermillion County; median housing costs within each county were below the statewide average (U.S. Census Bureau 2025).

Vehicular access to the Wabash Facility from Terre Haute and the surrounding area would rely primarily on State Road 63; vehicles would travel east on West Sandford Avenue for approximately 0.5 mile to reach the north entrances to the Wabash Facility. Vigo County has limited public transportation options. Terre Haute Transit provides bus service solely within the city of Terre Haute; therefore, workers would use private automobiles for their daily work commutes.

3.9.1 Employment and Project Schedule

The existing WRCGRDP facility is not currently in use, but it employs 10 full-time, on-site personnel. Beneficial socioeconomic impacts from the Project would occur from increased employment opportunities, tax revenue generation, and direct and indirect spending in the local economy. Project construction would result in a short-term increase in employment opportunities for the region. Employment opportunities for both construction and operation of the Project would provide well-paying and attractive jobs for the region's labor force.

In addition to direct economic benefits from wages and tax generation, the Project would create indirect benefits for businesses that supply the goods and services needed for Project construction and operations. The Project would also result in induced economic benefits from increased local business activity as workers (both directly and indirectly employed) for Project construction and subsequent operations purchase food, supplies, and other materials. Equipment and other materials necessary for construction would be purchased locally, based on availability and competitive pricing. Increased use of locally sourced labor and other inputs would result in greater economic benefits (direct, indirect, and induced) in the region.

As discussed in Section 2.3, construction of the Project would take approximately 3 years. During the 2-year peak period of equipment installation and construction for the Wabash Facility, staffing would vary from 144 to a maximum of 550 workers, with an average of approximately 270 workers. In addition, construction of the CO_2 injection well sites and FM sites would require approximately 20 workers during a shorter 6-month construction period.

The on-site workforce would consist of laborers, craftsmen, supervisors, support personnel, and construction management personnel. The local workforce would be used as much as practicable for construction. WVR is working with local stakeholders and labor organizations to encourage development of and use of the local workforce. Most of the construction workforce would be sourced locally through the local union halls in the Terre Haute area. As a result, the majority of construction workers would most likely commute daily from Terre Haute or other surrounding areas within the region. A portion of the construction workers may commute up to 1.5 hours for work. Consequently, the construction workforce obtained from outside the region is expected to be limited.

Project operations would create approximately 245 to 260 long-term employment opportunities. As discussed in Section 2.4.4, the Wabash Facility would require two 12-shifts per day, 7 days a week. The direct employee headcount for operation of the Project would be approximately 120 to 125 total for all shifts, along with 90 to 100 truckers and a contracted on-site maintenance and services support staff of approximately 30 to 35. The two CO_2 injection well sites and two FM sites would not have a permanent staff. A portion of the workers associated with Project operations may commute up to 1 hour. Only a limited number of the jobs associated with Project operations (25 percent) would require a college degree. As a result, the operations workforce obtained from outside the region is expected to be limited, resulting in, at most, a minor one-time population influx within Vigo County and the surrounding region.

Project construction and subsequent operations would result in beneficial socioeconomic impacts from increased employment opportunities, tax revenue generation, and direct and indirect spending in the local economy.

3.9.2 Housing and Traffic

As discussed in Section 3.9.1.1, a portion of the construction workers may need to commute 1 hour or more to the work site. As a result, the construction workforce obtained from outside the region would be limited. Any such influx of non-local workers would be housed temporarily in

existing motels and recreational vehicles during the construction period. Non-local construction workers very likely would stay in the Terre Haute area, given its proximity and available amenities. Terre Haute and the surrounding region have ample accommodations, housing, and associated infrastructure to absorb any influx of new residents due to job creation by the Project. As a result, no new local housing would be needed for Project construction workers.

As discussed in Section 3.6, construction-related increases in local traffic would result from workers commuting to and from the Project site (primarily to the Wabash Facility [where most of the construction labor force would be working]) at the beginning and end of their daily shifts. The nature and magnitude of employee traffic effects on local residents would depend on the workers' routes, time of travel, and roadway capacity. Construction workers would enter and exit the Wabash Facility via the existing intersection at State Road 63 and West Sandford Avenue. Construction worker traffic would vary through the course of the construction period as on-site requirements slowly increase through the construction phase, peaking at approximately 550 workers, then decrease as the construction phase reaches completion. Construction would not overlap with any product trucking activities because no significant production or other operations would occur before the completion of construction.

The increased traffic during peak construction could result in slower travel speeds and longer travel times for existing roadway users. Although the impact on individual users may be noticeable, the traffic effects would be temporary and would not be expected to have any measurable adverse effect on the region's businesses and economy.

Construction-related increases in local traffic also could result from the Project's equipment and material deliveries. Unlike traffic from construction workers, daily delivery trips would very likely occur in low numbers during non-commute periods. As a result, the traffic effects from Project deliveries would not be expected to have any measurable effect on the region's businesses and economy.

As discussed in Section 3.9.1.1, similar to the construction workforce, a portion of the workers for operations may be expected to commute up to 1 hour. The operations workforce obtained from outside the region is expected to be limited. As a result, Project operations would most likely result in, at most, a minor one-time increase in population from new workers in-migrating to Vigo County and the surrounding region. To accommodate any such influx from worker in-migration, existing housing within Vigo County and elsewhere within the region would be used by workers and their families. The Project would not directly or indirectly displace residents within the region. As a result. Project operations would have no adverse impacts on the region's housing availability.

Impacts associated with traffic during operations is discussed in detail in Section 3.6.2. Operations-related increases in local traffic would result from workers commuting to and from the Wabash Facility at the beginning and end of their daily work shifts as well as the required truck traffic to support the transport of CO_2 and anhydrous ammonia from the Wabash Facility. Traffic volumes discussed in Section 3.6.2 were based on a traffic engineering analysis, a turning analysis, and a noise impact analysis, all of which were commissioned by WVR (Appendix F). The traffic engineering analysis assessed the impacts at the intersection of State Road 63 and West Sandford Avenue, which is where the greatest increase in traffic would occur. The turning analysis assessed impacts on surrounding roads from CO_2 transport. The two FM wells would not have daily traffic associated with them. The noise impact analysis assessed impacts along the two routes associated with the transport of CO_2 to each CO_2 injection well site.

The nature and magnitude of employee traffic effects on local residents would depend on the workers' place of residence and time of travel. In the absence of any employee shuttle or

ridesharing, there could be up to 129 additional vehicle trips by workers during operations (both shift and contract workers) during peak periods; most workers would use State Road 63. The additional truck traffic for deliveries to the Wabash Facility and the transport of anhydrous ammonia and CO_2 from the Wabash Facility during operations would be dispersed throughout the day. There are no residences along West Sandford Avenue east of State Road 63. As discussed for construction, adverse speed and travel-time impacts on existing roadway users would depend on roadway capacity and user volumes. The traffic engineering analysis found that current road conditions at the intersection of State Road 63 and West Sandford Avenue would accommodate the projected increase in traffic; the traffic controls that are already in place would reduce traffic congestion during shift changes. In addition, if congestion or safety issues arise at any intersection in the future, WVR is committed to working with county and state transportation officials to facilitate timely investments and improvements that address the concerns effectively. Although the impact on individual users may be noticeable, the traffic effects would not have any measurable effect on the region's economy.

Operations-related local traffic impacts from the transport of CO_2 would occur over a constant 24-hour period, with nine to 10 CO_2 transport trucks per hour traveling from the Wabash Facility (i.e., approximately five trips per hour for each of the two CO_2 injection well sites, as shown in **Figure 3.6.1**). WVR would use electric hydrogen fuel cell trucks for CO_2 transport to minimize noise impacts on residents along the delivery route. As discussed in Section 3.5, CO_2 transport would not result in any adverse noise impacts on residents along the routes. The turning analysis determined that the routes, including all intersections, could support the required truck traffic, with no additional roadway pavement or gravel needed at the intersections. Therefore, impacts from Project CO_2 transport would not have any measurable effect on residents along the CO_2 transportation routes or the region's economy.

Project operations would have negligible adverse impacts on the socioeconomic conditions of the local area. In addition, potential socioeconomic impacts related to a Project-related population influx and housing availability are expected to be negligible. In reality, the Project would have positive benefits in the local area as is revitalizes a closed industrial facility and returns lost jobs to a former coal community. Furthermore, the Project, with its domestic production of critical products (e.g., anhydrous ammonia), would support the local agricultural community.

3.9.3 Public Services and Utilities

Any population influx due to Project construction would be limited in magnitude, temporary, and dispersed throughout Terre Haute and elsewhere with the surrounding region. Similarly, any permanent population influx resulting from Project operations would be, at most, a one-time increase of limited magnitude that would be dispersed throughout the surrounding region. The existing accommodations and housing supply in the region would be able to absorb any such additional demand, if it occurs; therefore, no construction of new housing would result from construction or operation of the Project. The potential small increases in public service demand would not change the service ratios for the population or result in increased fire, police, or ambulance response times. WVR would develop and keep a site-specific health and safety plan on-site at the Project facilities during both construction and operation of the Project. This document would outline construction and operational hazards, safety standards, and means for protecting public health. It would serve to reduce the number of incidents at the site.

Construction and operation of the Wabash Facility and both CO_2 injection well sites would result in incremental increases in utility usage, including water and energy. Power for Project sites would be supplied by the existing power lines along the nearby roadways. Power requirements

for the FM sites also would be met by the existing power lines along the nearby roadways. No upgrade to the existing electrical infrastructure would be required.

Project construction and subsequent operations would have minimal, if any, adverse economic impacts on the region's public services and utilities. Beneficial socioeconomic impacts of the Project would occur from increased employment opportunities, tax revenue generation, and direct and indirect spending in the local economy. Development of the Project would generate up to 260 jobs during operation. Because most of the Project's workers would be obtained from regional labor force. Due to the availability of housing and public services in the region, no significant adverse socioeconomic impacts are expected from construction or operation of the Project.

3.10 Health and Safety

Construction and operation of the Project would involve the typical health and safety issues that are common to all heavy industrial facilities. This would include the potential for occupational exposure to chemical and physical agents. Accidental releases also would be a possible exposure path for on-site workers and nearby residents. These risks would be mitigated through proper equipment design and operation. In addition, emergency release systems would vent and destroy gaseous streams from upsets in a flare. The risk of fire and/or explosion would be present due to the presence of large quantities of hydrogen and anhydrous ammonia. However, these risks would be mitigated through compliance with EPA's RMP (Clean Air Act Section 112[r]) and OSHA's PSM requirements for highly hazardous chemicals (29 CFR 1910.119).

The Wabash Facility would be subject to federal and state OSHA standards, such as the PSM requirements. For operation of the Project, the PSM program would encompass the following key elements: employee participation, process safety information, process hazard analysis (PHA), operating procedures, training, contractors, pre-start-up safety review, mechanical integrity, hot work permit, management of change, incident investigation, emergency planning and response, and compliance audits. The Wabash Facility would meet the criteria for inclusion in a PSM program.

Compliance with the construction safety standards of the Indiana OSHA would be the responsibility of the construction contractor selected for the site and overseen by WVR personnel. The construction contractor and WVR would also be responsible for compliance with Indiana Department of Homeland Security standards, requirements imposed following state and local fire marshal inspections, and Vigo County building commission requirements. This coordination would ensure that all requirements concerning fire protection systems, fire code compliance, and building occupancy certifications would be met.

WVR would adhere to the terms and conditions identified within the Project's applicable federal and state permits, authorizations, and clearances (as listed in Appendix A). The Project would be designed, constructed, tested, operated, and maintained to meet or exceed the requirements of the American Society for Mechanical Engineers, National Fire Protection Association, American Petroleum Institute, National Electric Code, and all other applicable codes and standards.

Protection of the public from harmful concentrations of air emissions is under the jurisdiction of EPA and the IDEM. The IDEM and EPA operate a network of air quality monitors throughout the United States, including monitors in Vigo County, which they use, together with other information, to judge the quality of the ambient air relative to public safety. As indicated in Section 3.4, the current air quality in the Project area complies with IDEM and EPA air quality standards, which are set at levels that are protective of human health and the environment. As part of IDEM's review of WVR's application to amend its existing air permit (Permit No. 167-

45208-00091) for the existing WRCGRDP, IDEM evaluated Project emissions with other emissions in the region and verified that the facility's emissions would not result in the significant deterioration of air quality or cause or contribute to an exceedance of an air quality standard.

Table 3.10-1 provides an analysis of potential safety hazards during construction, operation, and/or maintenance activities for the Project and summarizes strategies that WVR would employ to control each hazard.

Table 3.10-1: Construction, Operation, and Maintenance Hazard Analysis

Activity	Exposure Potential	Potential Hazard	Control Strategies
Heavy equipment operation	C, O, M	Employee injury and property damage from collisions with workers and/or facility equipment.	Implement heavy equipment safety program, ensure that equipment is routinely inspected, and ensure that operators are properly trained.
Trenching and excavation	C, M	Employee injury and property damage from collapse of trenches and excavations or contact with underground utilities.	Trenching and excavation would be performed by subcontractors using their own excavation and trenching safety program. Develop a trench safety plan and inspection program. All employees would receive training specific to excavation safety. Require digging permits before initiating excavation or trenching.
Vehicle operation	C, O, M	Employee injury from vehicle accident or pedestrian/vehicle accident.	Incorporate vehicle safety information in general safety training.
Work at heights	C, O, M	Employee injury due to falls from the same level and elevated work areas.	Implement a fall protection program that requires fall protection systems whenever unprotected work is performed at greater than 6 feet.
General project work	C, O, M	Employee injury resulting from a slip, trip, or fall.	Maintain good housekeeping, adequate lighting, compliant stairways, and railings.
Crane and derrick operation	C, M	Employee injuries and property damage due to falling loads.	Implement hoisting and rigging safety programs, inspect equipment routinely, and ensure that operators are properly trained.
Hot work	C, O, M	Employee injuries and property damage due to fire or explosion.	Implement fire protection and prevention program, require hot work permits, ensure that welders, pipe fitters, etc., are properly trained.
Working with combustible liquids	C, O, M	Employee injuries and property damage due to fire or explosion.	Implement fire protection and prevention program that includes procedures for the proper storage and use of flammable or combustible liquids.
Electrical work	C, O, M	Employee injuries due to contact with energized parts.	Implement energy control program, including lockout/tagout of energized sources. Use of only explosion-proof or inherently safe equipment in electrically classified areas.
Materials handling	C, O, M	Employee injuries due to improper lifting.	Implement an ergonomics program and train employees in proper lifting techniques.

Table 3.10-1: Construction, Operation, and Maintenance Hazard Analysis

Activity	Exposure Potential	Potential Hazard	Control Strategies
Confined space entries	C, M	Employee injuries due to suffocation, exposure to toxic materials, engulfment, etc.	Implement a confined space program, including permit procedures and air monitoring requirements.
Compressed gas storage	C, O, M	Employee injuries and equipment damage due to explosive release of pressure.	Implement a compressed gas safety program, including procedures for proper use and storage.
Power tool use	C, O, M	Employee injuries due to an improper use or use of damaged power tools.	Implement procedures for inspecting power tools before operation and train employees on the proper use and care of power tools.
Working with or near hazardous or toxic materials	C, O, M	Employee injuries due to exposure to hazardous and/or toxic materials.	Implement hazard communication program and exposure control procedures, including engineering controls, administrative controls, and PPE for activities that may expose employees to hazardous/toxic materials.
Working with or near noisy equipment	C, O, M	Employee over-exposure to noise.	Implement a hearing conservation program that includes identifying high noise activities and sources, sound-level monitoring, and use of PPE.
Working with or near exposed machinery	C, O, M	Employee injuries from entanglement in rotating or moving equipment.	Develop and implement machine guarding equipment lockout/tagout procedures.
Work outdoors	C, O, M	Employee injury or illness from biological hazards such as ticks, snakes, spiders, or wildlife.	Develop and implement procedures for outdoor work that warn employees of the potential for exposure and provide guidelines for avoidance of contact with biological hazards.
Work in weather extremes	C, O, M	Employee injury or illness due to heat or cold stress.	Develop and implement procedures for work in hot and cold environments that provide for employee monitoring, appropriate clothing, and other guidance.
Process operation	O, M	Exposure to an oxygen-deficient atmosphere due to a carbon dioxide leak. Potential asphyxiation and/or death.	Personal oxygen monitors, area oxygen monitors, and piping corrosion control plan.
Equipment maintenance	O, M	Release of ammonia or hydrogen gas. With spark, potential explosion. Death and/or adverse impact on surrounding facility and neighboring facilities.	Conduct a design PHA. Electrically classify areas where ammonia and hydrogen are handled, used, piped, and stored. Use non-sparking maintenance tools. Use intrinsically safe handheld electronics (radios, flashlights, cameras, gas detectors, etc.). Well-developed and sustainable mechanical integrity program, based on recognized and generally accepted good engineering practices.

Table 3.10-1: Construction, Operation, and Maintenance Hazard Analysis

Activity	Exposure Potential	Potential Hazard	Control Strategies
Process operation	O, M	Release of ammonia or hydrogen gas. With spark, potential explosion. Death and/or adverse impact on surrounding facility and neighboring facilities.	Conduct a design PHA. Electrically classify areas where ammonia and hydrogen are handled, used, piped, and stored. Compliance with 29 CFR 1910.119 and 40 CFR 68 (PSM and RMP). Proper system design, including materials for construction and relief venting calculations. Implementation of prevention and protection measures, including relief devices, interlocks, detectors, and fire suppression systems.

Notes:
C = construction phase
O = facility operations
M = facilities maintenance

3.10.1 Construction Health and Safety Programs

Before beginning construction activities, WVR would develop a site-specific construction health and safety program for the Project. Prior to the initial operations of the Project, WVR would develop detailed operational health and safety plans.

Construction Health and Safety Programs. Consistent with the policy of the Indiana OSHA on multi-employer work sites, each employer would be responsible for the health and safety of its own employees. Periodic health and safety audits would be conducted by WVR to verify contractor and subcontractor compliance with contractual health and safety obligations.

Construction PPE Program. Contractor employees would use PPE during construction, as specified in the construction PPE program. Required PPE would be identified through hazard assessment and general industry standards. The specific PPE ensemble required for each job task would be specified in the job hazard analysis for that task. The use of PPE for site activities would include, but not be limited to, the items described in **Table 3.10-1**. All PPE worn on-site would comply with the applicable OSHA and American National Standards Institute requirements. Respiratory protection would be included in the PPE program; however, employees would not be required to wear respiratory protection or be permitted to work in areas requiring respiratory protection until they have received a medical evaluation, respirator fit-testing, and training on the proper use, limitations, and care of respirators.

Construction Exposure Monitoring Program. An exposure monitoring program would be developed to evaluate potential employee exposures to hazardous/toxic materials. Potential exposures would be identified during the task-specific job hazard analyses. If necessary, air monitoring may be conducted to evaluate the potential for employee exposures to the contaminants of concern. Airborne exposures would be controlled through the implementation of engineering controls, administrative controls, or PPE. Air monitoring would also be required in support of other safety programs, including confined space entry, hot work permits, and emergency response. To evaluate potential employee noise exposures, sound-level monitoring

would also be performed as necessary during the construction phase and initially during new facility operation. Odor complaints would be investigated and mitigated as needed.

Construction Emergency Action Plan. An emergency action plan (EAP) would be developed specifically for the construction phase of the Project. The EAP would designate responsibilities and actions to be taken in the event of an emergency at the site. All employees and contractors working at the site would be trained on the contents of the program. All visitors to the site would either be escorted by a fully trained staff or receive training in the EAP. The EAP would include:

- Emergency roles and responsibilities
- Emergency notification procedures
- Egress routes and mustering points

Construction Written Safety Programs. Additional written safety programs would be established for the construction phase.

Construction Employee Safety Training Program. Workers participating in the construction phase of the Project would participate in applicable training programs designed to protect themselves, other employees, and the public from injuries while working at the site. All construction personnel would be required to attend a basic site safety orientation training course. Additional training would be provided to each individual, based specifically on their job responsibilities or craft for those requirements where previous satisfactory training cannot be documented. All training courses would be documented, and attendance records would be maintained at a centralized location.

Construction Fire Suppression and Prevention. Construction of the Project would rely on both on-site fire protection systems and off-site local fire protection services. New Goshen Fire and Rescue would be the primary responding agency to the Wabash Facility and the southern injection well construction sites. The Black Diamond Fire Department would be the primary responding agency to the northern injection well construction sites. WVR's construction contractor would develop a Fire Protection and Prevention Plan to be followed throughout all phases of construction and would provide the specified fire-fighting equipment.

The Project on-site fire suppression system would be supported by the Sugar Creek Fire Department, which would provide backup assistance and support to the Project in the event of a construction-related fire. The local fire response units would be provided information regarding the type and location of potential fire hazards at the site. This information would be included in emergency response planning.

3.10.2 Operations and Maintenance Health and Safety Programs

On completion of construction and start-up of the Project, including implementation of routine operations, the construction health and safety prevention programs would transition into an operation-oriented program that would reflect the hazards and controls necessary during routine operations and maintenance of Project facilities. Prior to beginning operations, the following activities would be conducted:

- Document an initial PHA
- Address all recommendations from the PHA
- Conduct and document a pre-startup safety review.
- Register the site with EPA's RMP program

- Develop specific standard operating procedures for operations
- Develop specific standard maintenance procedures
- Develop and implement a health and safety training program, including PSM training
- Develop and document both a maintenance and operator qualification program

Emergency Action Plan. In addition to the incorporation of various safety and environmental features and design measures to minimize emergencies and their effects on public and worker safety, WVR would have site-specific EAPs for all parts of the Project. The EAPs would address potential emergencies, including chemical releases, fires, bomb threats, pressure vessel ruptures, aqueous ammonia releases, CO_2 releases, and other unexpected events. It would describe evacuation routes, alarm systems, points of contact, assembly areas, responsibilities, and other actions to be taken in the event of an emergency. The plan would include a layout map, a fire extinguisher list, and a description of arrangements with local emergency response agencies for responding to emergencies.

Hazardous Materials Management Program. A small quantity, less than 15,000 gallons, of hazardous materials can be expected to be used and stored at the site during construction and during normal operations. These quantities would be associated primarily with water treatment chemicals. A copy of the safety data sheet for each stored chemical would be added to the facility safety data sheet binder. All chemicals would be stored in approved containers that are compatible with the stored chemicals' properties. Potentially flammable stored chemicals would be kept in designated areas and approved fireproof cabinets with integrated containments. When required, bulk chemicals would be stored in approved storage tanks that would be designed for the chemicals; the design would meet American Petroleum Institute or Steel Tank Institute standards. The primary bulk chemicals stored would be associated with water treatment, consisting of sulfuric acid and bleach. All storage tanks would be grounded and/or bonded to reduce static build-up in the tanks. Storage vessels would be appropriately vented for the stored contents and remain closed at all times, except when adding or removing stored product. Safety showers and emergency eyewash stations would be provided within 10 seconds of unimpeded travel time (approximately 55 feet) from all areas where chemicals would be used or stored.

Operations and Maintenance PPE Program. PPE requirements for work at the Project facilities would be identified during the job hazard analyses process. The PPE requirements would be developed and incorporated into the site-specific injury and illness prevention program.

Operations and Maintenance Written Safety Program. Additional written safety programs would be developed and implemented as necessary to address hazards that are identified as a result of the operation and maintenance of the Project facilities. These programs would be included in the operations and maintenance injury and illness prevention program for the facilities. A full listing of safety policies is provided as Appendix D

Operation and Maintenance Employee Safety Training Programs. To ensure that employees recognize and understand how to protect themselves and the public from hazards that exist at the Project facilities, WVR would implement a comprehensive training program for operations personnel. Operations and maintenance employees assigned to the Project facilities would be given instructions regarding their responsibility for the safe conduct of their work. These instructions would be given at the time the employee is first hired and as an ongoing training program of hazard recognition and avoidance. Employees would also be instructed in the safety procedures pertinent to their employment tasks. Safe working conditions, work

practices, and protective equipment requirements would be communicated in the manner outlined below.

- A new, promoted, or transferred employee would receive safety training orientation.
- An employee-led safety committee meeting would be held periodically with support from management.
- "Toolbox/tailgate" safety meetings would be conducted prior to each shift or at a change of a process/task for each crew. General safety topics and specific hazards that may be encountered would be discussed. Comments and suggestions from all employees would be encouraged.
- A periodic staff safety meeting would be held for supervisors and facility leadership to review process changes and safety trends.
- Hazard communication training would be conducted as necessary when new hazardous materials are introduced to the workplace.
- Safety data sheets would be available as required for all appropriate chemicals.
- A bulletin board with required postings and other information would be maintained at the plant site.
- Warning signs (e.g., "Hazardous Waste Storage Area," "Confined Space Area") would be posted in hazardous areas that comply with applicable regulations (i.e., bilingual, correct font size).

An element of the operations and maintenance safety training program would include addressing compliance with contractor safety while on-site. Contractors would be provided with a list of potential job safety hazards for their assigned activity by a foreman, including safety rules, chemical exposure hazards, physical hazards, and PPE. Contractors would also be invited to attend "tailgate" safety meetings.

Operation and Maintenance Fire Suppression and Prevention. Operation and maintenance of the Project would also rely on both on-site fire protection systems and off-site local fire protection services. WVR would develop a fire protection and prevention plan for the Project to be followed throughout all phases of construction and provide the specified fire-fighting equipment.

The Wabash Facility on-site fire suppression system would be supported by the Sugar Creek Fire Department, which would provide backup assistance and support to the Project in the event of a fire. The local fire response units would be provided information regarding the type and location of potential fire hazards at the site. This information would be included in emergency response planning.

WVR would follow all applicable codes and standards for operation of hydrogen fuel cell trucks. In general, hydrogen fuel cell vehicles pose no safety concerns different from those of conventional vehicles, other than safety standards specifically related to hydrogen storage and fuel systems. WVR would ensure that the trucks would be designed to meet applicable standards, including 49 CFR Part 571, Fuel System Integrity of Hydrogen Vehicles.

WVR would maintain both a plumbed automatic fire suppression system and handheld fire extinguishers throughout the facilities to protect facility property and personnel from fire. WVR would maintain and inspect fire suppression systems and equipment as required by the State Fire Marshal's Office and the National Fire Prevention Association. Boilers and elevators would

be maintained to industry standards. Boilers would be permitted by the State Fire Marshal's Office, and elevators would be permitted and inspected by the Indiana Department of Homeland Security. The IDEM Office of Land Quality (OLQ) regulates aboveground storage tanks that store flammable and combustible liquids.

Given the nature of the proposed activities and compliance with applicable health and safety regulations, as well as the Project's implementation of standard best practices and relevant safety protocols, the potential impacts on public and worker health and safety would be minimal and not expected to rise to a level of significance.

3.11 Waste Management

The Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Sections 6901–6992k, provides the basic framework for the federal regulation of non-hazardous and hazardous waste. RCRA's Subtitle D establishes state responsibility for regulating non-hazardous wastes, while Subtitle C controls the generation, transfer, storage, and disposal of hazardous waste through a comprehensive "cradle to grave" system of hazardous waste management techniques and requirements. EPA is responsible for implementing the law; the implementing regulations are set forth in 40 CFR 260 et seq. The law allows EPA to delegate administration of the RCRA programs to the various states, provided that the state programs meet or exceed the federal requirements. Indiana's current revision was authorized by EPA on October 22, 2020. The IDEM Solid Waste Management Division (329 IAC) is responsible for administering the state's hazardous waste program.

Non-hazardous solid waste in the state of Indiana is regulated under the IDEM OLQ (329 IAC 10, 11, and 12). State and local efforts in source reduction, recycling, and land disposal safety are coordinated through the OLQ Office of Pollution and Prevention Technology. OLQ requires each land disposal facility and each processing facility to submit an integrated waste management plan to the state. OLQ affects facility operations to the extent that hazardous wastes are not to be disposed of with non-hazardous wastes. Coal combustion residual is managed by IDEM under 329 IAC 10.

Indiana has developed its own program to regulate hazardous waste under the Indiana hazardous waste rules (329 IAC 3.1). Primary authority for statewide administration and enforcement of Indiana's hazardous waste rules rests with the IDEM. No specific local regulations govern the handling of industrial waste.

3.11.1 Construction

The primary waste that would be generated during construction of the Project would be solid non-hazardous waste. A small amount of hazardous waste also would be generated during construction. The types of waste and estimated quantities generated during construction are summarized in **Table 3.11-1** and described below.

Table 3.11-1: Summary of Anticipated Solid Waste Streams and Management Methods during Construction

Waste Stream	Waste Characteristics	Estimated Quantity	Estimated Frequency of Generation	Waste Management Method	
				On-site	Off-site Treatment
Scrap wood, steel, copper, aluminum, rags, abrasive materials, glass, plastic, paper, insulation, cardboard, and corrugated packaging	Non-hazardous solids	2 tons	Twice weekly	Containerize	Recycle and/or Class II/III landfill disposal
Empty hazardous material containers	Hazardous solids	< 2 cubic yards	Monthly	Containerize and store for < 90 days	Recycle and/or Class I/II landfill disposal
Spent welding materials	Hazardous solid	< 2 cubic yards	Monthly	Containerize and store for < 90 days	Recycle and/or Class I landfill disposal
Concrete and soil	Non-hazardous	Up to 200 cubic yards	One time	Stockpile and cover	Reuse, recycle, or dispose to Class II/III landfill
Drilling fluids (four sites total)	Non-hazardous	175,000 gallons	One Time	Containerize	Disposal through licensed third party
Drilling cuttings (four sites total)	Non-hazardous	750 cubic yards	One Time	Stockpile and cover	On-site disposal

3.11.1.1 Non-hazardous Solid Wastes

Waste characterized as non-hazardous solid waste produced during construction would be collected in an on-site dumpster and picked up for disposal by a licensed waste hauler. Construction debris dumpsters would be covered and emptied twice a week. The waste would be taken to an appropriate facility where segregated recyclable materials would be transported to the appropriate facility and non-recyclable refuse would be disposed of at an appropriate landfill.

Non-hazardous solid wastes generated during construction would include excess scrap wood, steel, copper, aluminum, abrasive materials, glass, plastic, paper, insulation, cardboard, and corrugated packaging. The anticipated waste streams during construction and their estimated quantities are described below and summarized in **Table 3.11-1**. Approximately 2 tons of this waste would be generated twice a week during the construction phase. Where practical, these wastes would be recycled. Non-hazardous wastes that are not recycled would be disposed of at a Class III landfill in accordance with all federal, state, and local regulations. Quantities of non-hazardous waste generated by construction of the Project would easily be accommodated by existing landfills and recycling facilities.

Metal wastes would include scrap steel and aluminum used in construction and copper from wire trimming during construction. Where practical, ferrous and nonferrous waste metals would be recycled.

Waste soil would be generated from site excavation activities and any trenching that may be required for the installation of utilities. Where practical and of acceptable quality (i.e., compliant with state standards), soil would be reused for landscaping or other related purposes. Up to 200

cubic yards of waste concrete and soil would be generated during construction activities. Concrete and soil not reused at the site would be recycled or disposed of at a Class II/III landfill in accordance with all federal, state, and local regulations. Soils suspected of being contaminated during excavation would be screened by an environmental professional and segregated in a lined and covered containment while waiting for proper waste classification and final determination for disposal.

Drilling and completion of the two CO_2 injection wells, two CM wells, and two FM wells would generate a specific waste stream of drilling fluids. At the completion of drilling each well, the drilling fluid would be hauled off-site and disposed of at a licensed disposal facility. It is expected that a total of 175,000 gallons of drilling fluid would be generated during the construction process.

Drill cuttings would be stockpiled during drilling operations and thereafter managed through land application in accordance with Indiana regulatory requirements. It is expected a total of 750 cubic yards of cuttings would be generated during all drilling activities for the entire Project.

3.11.1.2 Hazardous Solid Wastes

Most of the hazardous waste generated during construction would consist of spent welding materials and empty hazardous materials containers. It is anticipated that less than 1 cubic yard of each of these wastes would be generated monthly during construction activities. Quantities of hazardous waste generated during construction of the Project would easily be accommodated by existing Class I and recycling facilities.

The general contractor would be considered the generator of any hazardous waste associated with construction and responsible for proper handling of all hazardous wastes in accordance with all federal and state regulations. The general contractor's responsibilities would include all licensing requirements, training of employees where required, accumulation limits, labeling, recordkeeping, and reporting requirements. Wastes that are deemed hazardous would be collected in hazardous waste accumulation containers that would be covered and constructed of material compatible with the hazardous waste being stored. Accumulation containers should be placed near the area of generation. At the end of each workday, the accumulation containers would be moved to the contractor's licensed hazardous waste accumulation area where hazardous wastes could be stored up to 90 days after the date of generation. The construction contractor would manifest these wastes for disposal at a permitted Class I facility or recycling facility in accordance with all federal and state regulations. All hazardous wastes would be removed from the site by a licensed hazardous waste management contractor.

3.11.2 Operation

No considerable change to the quantity of hazardous waste produced would occur due to operation of the updated and new facilities. During past operations, the Wabash Facility generated approximately 10 cubic yards of general waste per week. A slight increase in solid waste would be anticipated with additional personnel and production activities, but this increase would be managed through BMPs for waste reduction and recycling. The total amount of general waste would not exceed 10 cubic yards per week. The addition of the ammonia synthesis facility would not create an increase in hazardous waste on-site. A reduction in universal wastes (i.e., hazardous) generated through facility maintenance activities would occur with facility upgrades and incorporation of BMPs in the design of Project facilities (e.g., the elimination of mercury-containing fluorescent bulbs and improvements to the efficiency of facility equipment).

During operation and maintenance of the Project facilities, non-hazardous solid wastes would be generated. These wastes would include spent media from filtration operations and other solids such as slag from process tanks and spent catalyst. Prior plant operations and waste characterizations, along with information developed during the design of the Project, helped determine the classification of these waste streams. With the addition of the new facilities, the periodic generation of non-hazardous waste streams would increase. This is associated primarily with the changing of catalysts used in the new processes. Non-hazardous solid wastes would be recycled, to the extent practical, and the remainder would be disposed of on a regular basis at a Class III landfill. The types of wastes and estimated quantities that would be generated during operations are described below and summarized in **Table 3.11-2**.

Table 3.11-2: Summary of Anticipated Solid Waste Streams and Management Methods during Operations

Waste Stream	Waste Characteristics	Estimated Quantity	Estimated Frequency of Generation	Waste Management Method		Process Source
				On-site	Off-site Treatment	
Solids from slurry storage tank (slag)	Non-hazardous	40 tons	Daily	Stored or containerized for use on-site	Containerized and shipped for potential reuse in off-site landfill cover in construction material	Gasification
General waste (office paper, cardboard, food waste, plastic packaging)	Non-hazardous	10 cubic yards	Weekly	Containerized for recycling or disposal	Recycle or disposal at Class II/III landfill	Entire facility
Used oil	Non-hazardous	200 gallons	Yearly	Containerized for recycling or disposal	Recycle or provide to licensed disposal company	Entire facility
Dry cake (brine) from rotary drum crystallizer	Hazardous	10 tons	Weekly	Containerized for disposal	Disposal to licensed treatment, storage, and disposal facility	Gasification
Spent reverse osmosis membrane cartridges	Non-hazardous	1 ton	Quarterly	Containerized for recycling or disposal	Reuse and disposal at Class II/III landfill	Gasification
Quality control laboratory waste, paper, cardboard, plastic, glass	Non-hazardous	1 ton	Yearly	Containerized for recycling or disposal	Recycle or disposal at Class II/III landfill	Entire facility
Activated carbon bed	Non-hazardous	< 1 ton	Every 3 to 4 years	Containerize for potential recycling or disposal	Recycle and/or Class II/III landfill disposal	Gasification
Carbonyl sulfide hydrolysis catalyst	Non-hazardous	> 100 ton	Every 5 years	Containerize for potential recycling or disposal	Recycle and/or Class II/III landfill disposal	Gasification
Water gas shift catalyst	Non-hazardous	> 200 ton	Every 3 years	Containerize for potential recycling or disposal	Recycle and/or Class II/III landfill disposal	Hydrogen production and CO_2 capture
Ammonia converter catalyst	Non-hazardous	> 150 ton	Every 15 year	Containerize for potential recycling or disposal	Recycle and/or Class II/III landfill disposal	Ammonia synthesis
Universal waste (e.g., batteries, aerosol cans), maintenance activities	Hazardous solids	Up to 20 pounds	Yearly	Containerize for recycling or disposal	Disposal to licensed treatment, storage, and disposal facility	Entire facility

3.11.2.1 Non-hazardous Solid Wastes

The general non-hazardous solid waste produced during normal day-to-day operation, including general wastes such as paper, cardboard, plastic, and glass from the quality control laboratory, would be collected in an on-site dumpster or stored in an appropriate fashion while awaiting disposal. To the extent possible, materials would be reused or recycled. Non-recyclable solid wastes would be taken to an appropriate licensed facility for disposal.

Non-hazardous solid wastes generated during operations would consist primarily of slag from the slurry storage tank. This would be a non-leaching product and expected to pass all required toxicity characteristic leaching procedure tests. It would be disposed of as a non-hazardous waste or used as clean fill material. Up to 40 tons of this waste could be generated on a daily basis; based on historical facility operations, local resources can accommodate management of these wastes. Spent filtration media (sand and resin) and spent catalyst would be collected in specific containers for disposal. Where practical, these wastes would be recycled or reused in on-site processes. Non-hazardous wastes not recycled or reused on-site would disposed of at a Class III landfill in accordance with all federal, state, and local regulations.

3.11.2.2 Hazardous Solid Wastes

The hazardous waste generated during operations would consist mainly of dry cake (brine) from the evaporator crystallizer and universal-type waste such as batteries. Up to 10 tons of dry cake (brine) would be generated weekly, and approximately 20 pounds of universal waste(s) would be generated yearly during operation of the Wabash Facility. Hazardous solid wastes would be disposed of at a Class I landfill in accordance with all federal and state regulations; based on historical facility operations, local resources can accommodate management of this waste.

To prevent impacts on human health or the environment, procedures would be developed for the proper handling, labeling, packaging, storage, and disposal of hazardous waste, along with recordkeeping. The general procedures below would be employed.

- Hazardous wastes would be stored on-site for less than 90 days in accordance with the requirements of 40 CFR Section 262.17.
- Hazardous wastes would be segregated for compatibility and stored in designated accumulation areas with appropriate secondary containment.
- Hazardous wastes would be picked up for transport only by licensed hazardous waste haulers. All hazardous wastes would be properly manifested to a permitted disposal facility.
- Hazardous waste documentation, including the biennial hazardous waste generator reports that would be submitted to the IDEM, would be kept on-site and be accessible for inspection for a period of not less than 3 years.
- Employees would be trained in hazardous waste management, spill prevention and response, and waste minimization.
- Procedures would be developed to reduce the quantity of hazardous waste generated. Non-hazardous materials would be substituted for hazardous materials, and wastes would be recycled where possible.

Impervious surfaces would be developed at the Wabash Facility at locations where oil or other contaminants have the potential to be spilled; therefore, no activities during operations would have the potential to affect subsurface conditions. At the CO_2 injection well sites, potential

impacts on subsurface conditions would be managed under the requirements of the EPA Class VI UIC permits obtained for those sites.

In light of the waste management measures and regulatory structure discussed above, the management of waste at the Wabash Facility and CO_2 injection well sites is not anticipated to have any significant environmental impact.

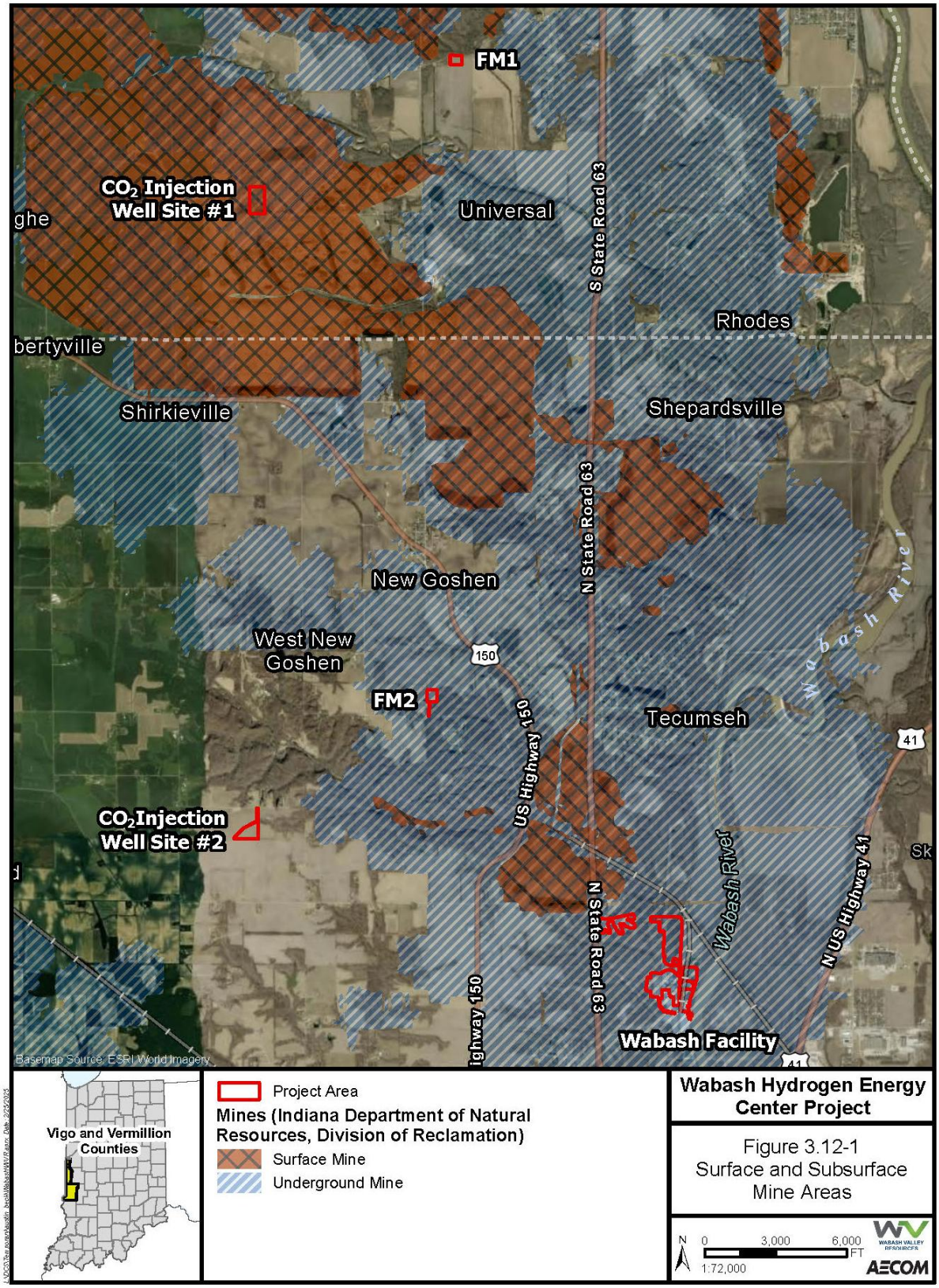
3.12 Soils and Prime Farmland

The Wabash Facility, CO_2 injection well Site #2, and the FM2 site are all located in a rural area, primarily in the northwestern corner of Vigo County. CO_2 injection well Site #1 and the FM1 site are farther north, in Vermillion County, Indiana. Land uses outside of urban/municipal areas in this region largely are agriculturally based; however, the Wabash Facility is in an area that has been zoned for heavy industrial uses. Surficial features in the Project vicinity have been altered by manmade activities, the two most prominent being previous surface coal mining activities and sand and gravel mining (i.e., mineral excavation, surficial deposition of spoils, remnant excavations).

Subsidence is the uniform depression of an area of land due to a change in subsurface conditions. Subsidence may result from pumping groundwater or mining minerals or rock. The geologic materials underlying CO_2 injection well Site #1 in Vigo County and FM2 in Vermillion County are not susceptible to subsidence resulting from groundwater pumping; however, historic subsurface coal mining within areas around the Wabash Facility and FM2 in Vigo County and surface mining around CO_2 injection well Site #1 in Vermillion County may result in localized subsidence potential. Surface and subsurface mine areas in the Project area are shown in **Figure 3.12-1**. Subsidence risks and potential mitigation measures, if warranted, would be evaluated during geotechnical studies completed in support of Project development/construction.

Erosion of existing landforms may result from modified surface water drainage during Project construction. No new floodplain or wetland intrusion is anticipated with the Project.

Figure 3.12-1: Surface and Subsurface Mine Areas



3.12.1 Soil

Soil descriptions for the Project are summarized in **Table 3.12-1,** based on data from the NRCS Soil Survey Geographic Database (SSURGO) (NRCS 2024). Detailed soil maps for each Project location are provided in **Figures 3.12-2A** through **3.12-2G** (as indicated in **Table 3.12-1**).

Table 3.12-1: Soil Types

Soil Unit Symbol	Current Use	Acres	Percent of Total Acres	Farmland Classification
Hydrogen Production and CO_2 Capture Facilities (Figure 3.12-2A)				
Ma	Industrial	43.60	84.9%	Not prime
HkF	Industrial/wooded	5.64	11.0%	Not prime
MuB2	Wooded	2.02	3.9%	Prime
W	River	0.05	0.1%	Not prime
Sh	Wooded	0.03	< 0.1%	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Ammonia Synthesis Facility (Figure 3.12-2B)				
HkF	Wooded/farm	18.42	49.9%	Not prime
AlB2	Wooded	12.43	33.7%	Prime
Ma	Wooded	3.97	10.8%	Not prime
AlC3	Wooded	1.47	4.0%	Not prime
Sh	Wooded	0.61	1.7%	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Laydown Yard/Parking Area (Figure 3.12-2C)				
XeB2	Wooded/farm	12.99	73.5%	Prime
HkF	Wooded/farm	4.60	26.1%	Not prime
AlB2	Wooded	0.08	0.4%	Not prime
CO_2 Injection Well Site #1 (Figure 3.12-2D)				
OrB	Farm	16.65	100%	Not prime
FM1 (Figure 3.12-2E)				
Ee	Farm	4.45	100%	Prime farmland if protected from flooding or not frequently flooded during the growing season
CO_2 Injection Well Site #2 (Figure 3.12-2F)				
Fn	Farm	7.11	62.3%	Prime farmland if drained
Ra	Farm	3.33	29.2%	Prime farmland if drained
XeB2	Farm	0.97	8.5%	Prime

Table 3.12-1: Soil Types

Soil Unit Symbol	Current Use	Acres	Percent of Total Acres	Farmland Classification
FM2 (Figure 3.12-2G)				
XeB2	Farm	3.09	64.1%	Prime
Fn	Farm	1.61	33.4%	Prime farmland if drained
RuC2	Wooded	0.05	1.0%	Not prime
HeG	Wooded	0.04	0.9%	Not prime
Sh	Wooded	0.02	0.4%	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
RuD2	Wooded	0.02	0.3%	Prime farmland if drained

Soil Unit Definitions:

Ma – Made land
HKf – Hickory loam, 25 to 40 percent slopes
MuB2 – Muren silt loam, 2 to 6 percent slopes, eroded
W – Water
Sh – Shoals silt loam, 0 to 2 percent slopes, frequently flooded, brief duration
AlB2 – Alford silt loam, 2 to 5 percent slopes, eroded
AlC3 – Alford silt loam, 5 to 10 percent slopes, severely eroded
XeB2 – Xenia silt loam, 2 to 6 percent slopes, eroded
OrB – Orthents, loamy, 0 to 8 percent slopes
Ee – Eel silt loam, 0 to 2 percent slopes, frequently flooded
Fn – Fincastle silt loam, Bloomington Ridged Plain, 0 to 2 percent slopes
Ra – Ragsdale silt loam, 0 to 2 percent slopes
RuC2 - Russell silt loam, Bloomington Ridged Plain, 5 to 10 percent slopes, eroded
HeG - Hennepin loam, 25 to 50 percent slopes
RuD2 – Russell silt loam, 12 to 18 percent slopes, eroded

Figure 3.12-2A: Soil Types Hydrogen Production and CO_2 Capture Facilities

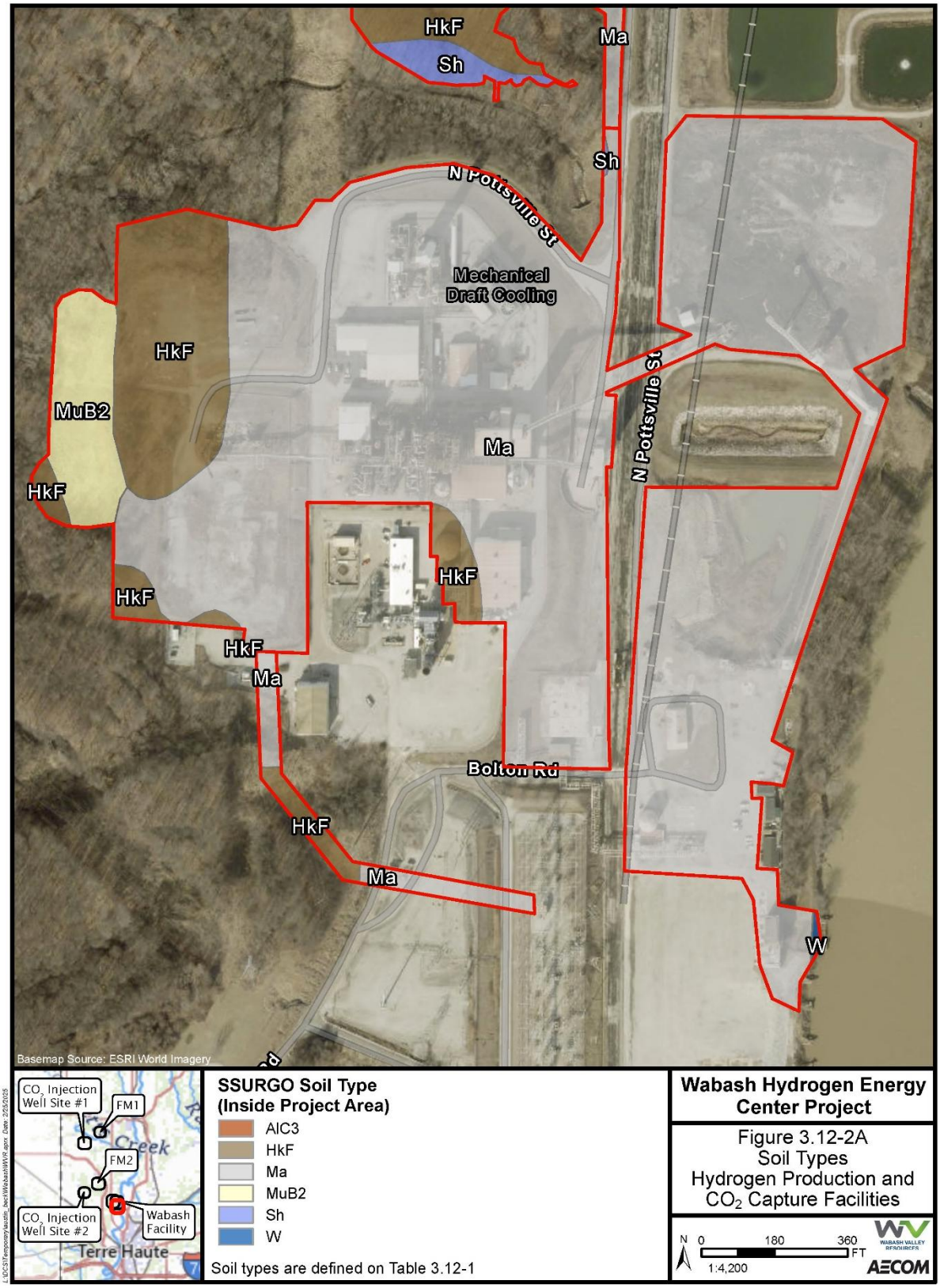


Figure 3.12-2B: Soil Types Ammonia Synthesis Facility

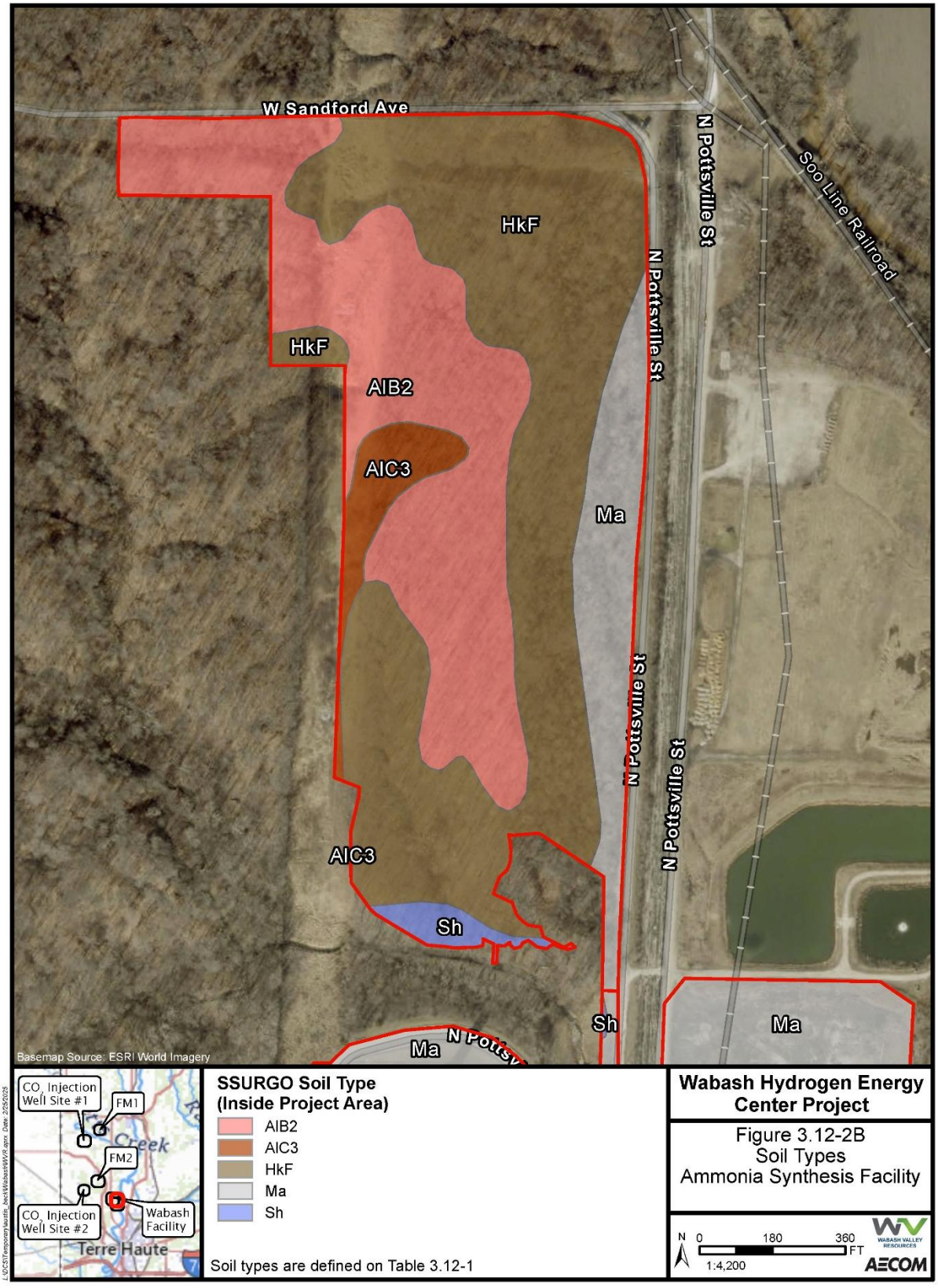


Figure 3.12-2C: Soil Types Laydown Yard/Parking Area

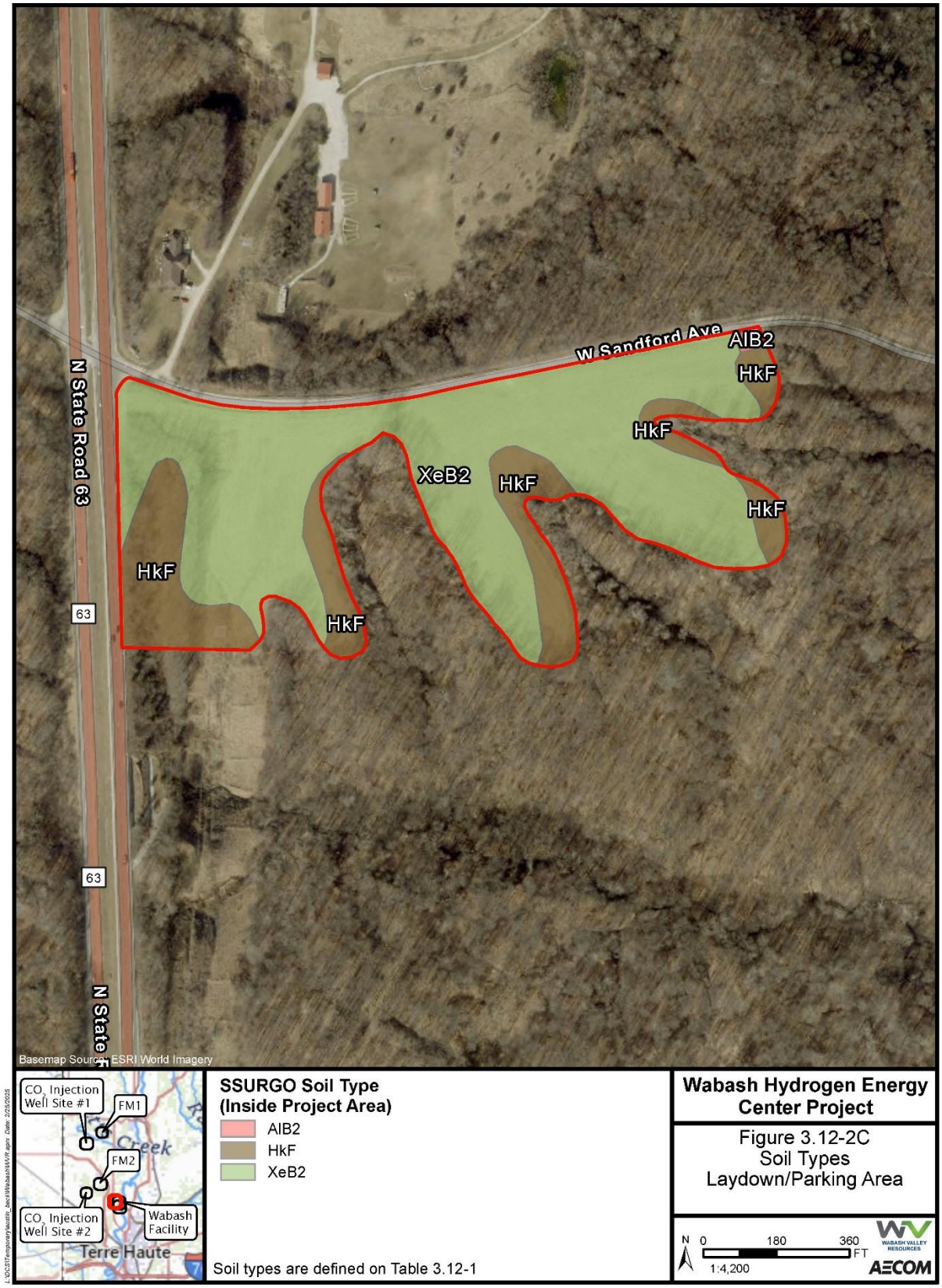


Figure 3.12-2D: Soil Types CO_2 Injection Well Site #1

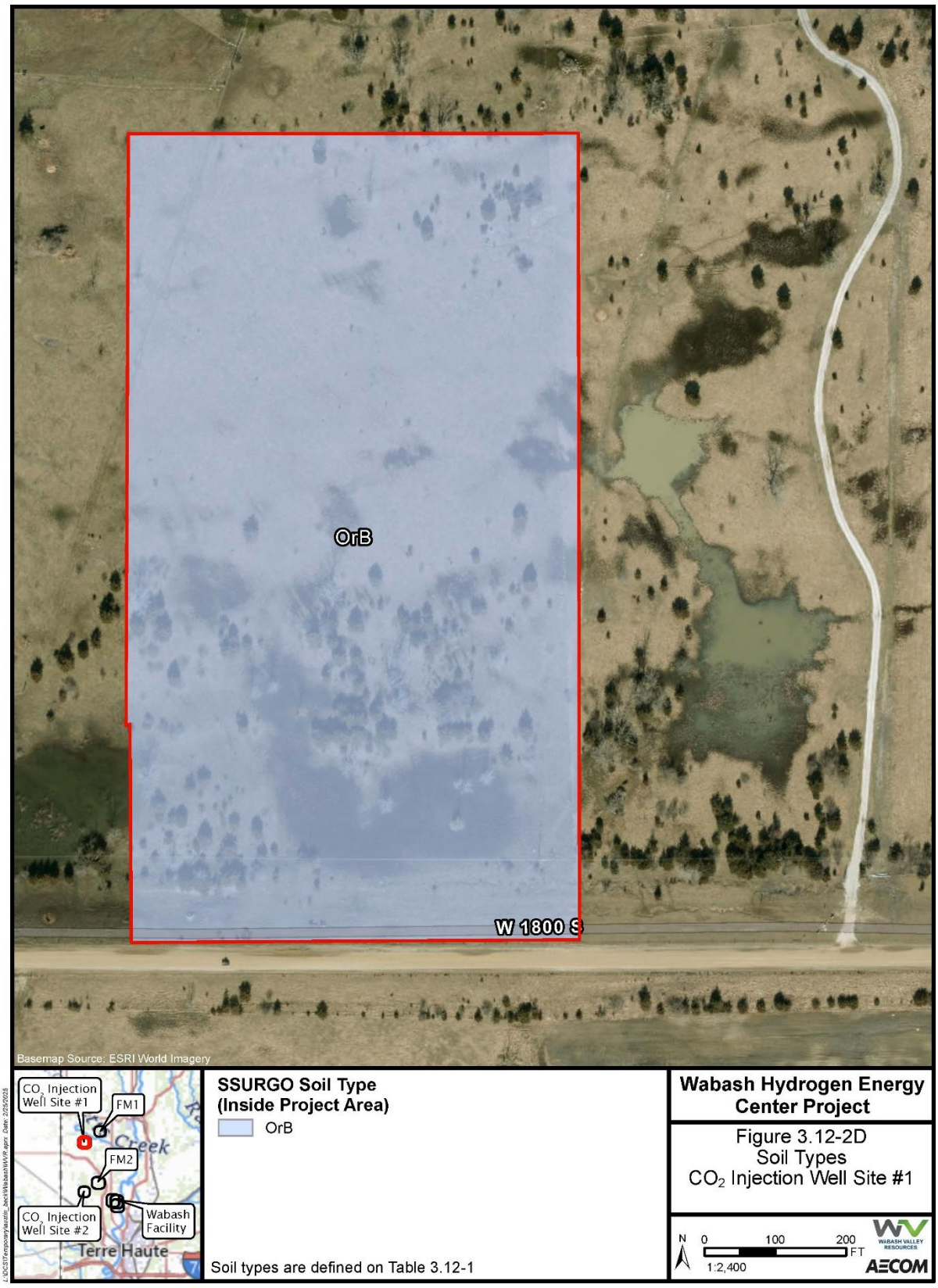


Figure 3.12-2E: Soil Types Formation Monitoring Well #1

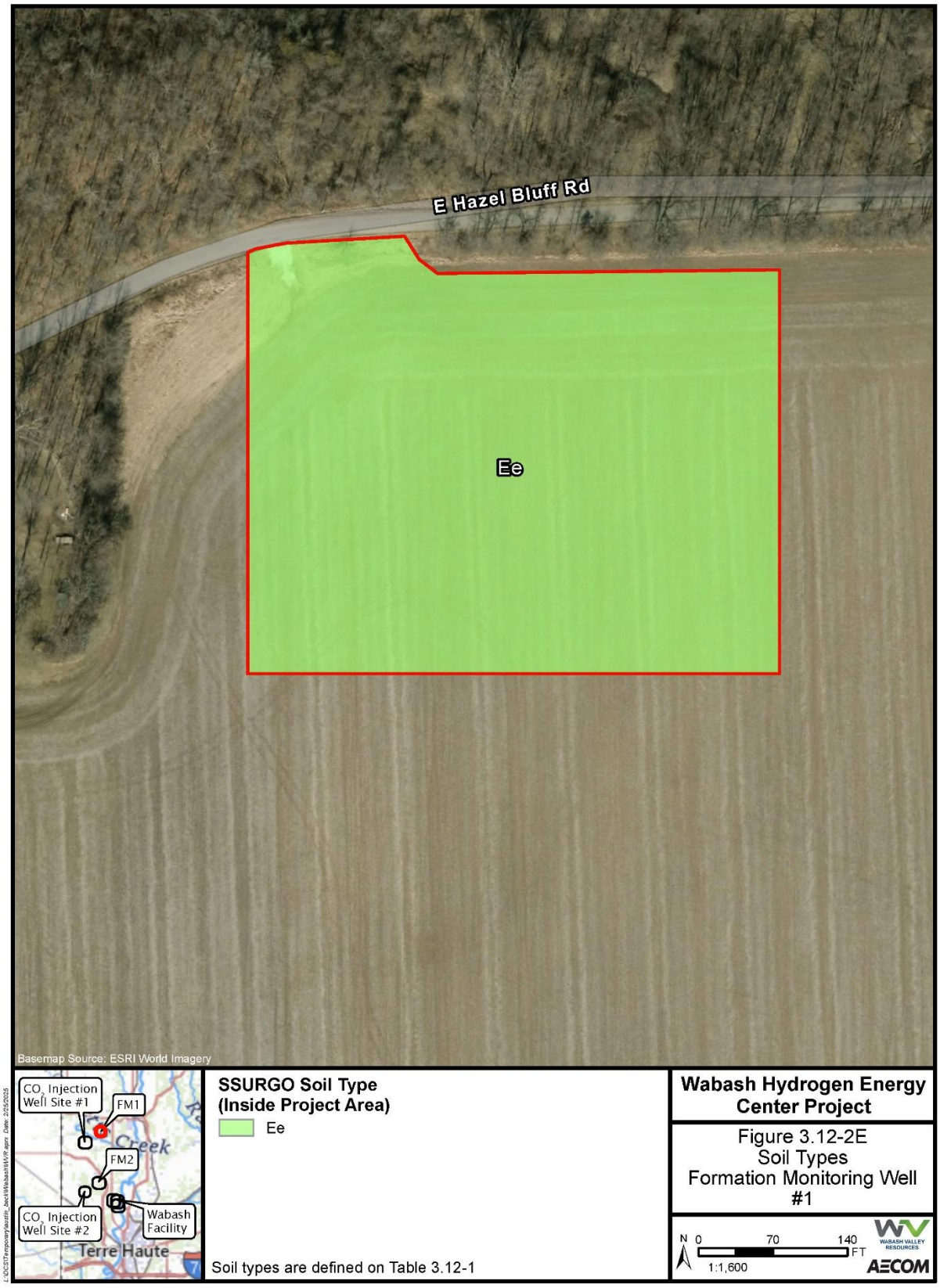


Figure 3.12-2F: Soil Types CO_2 Injection Well Site #2

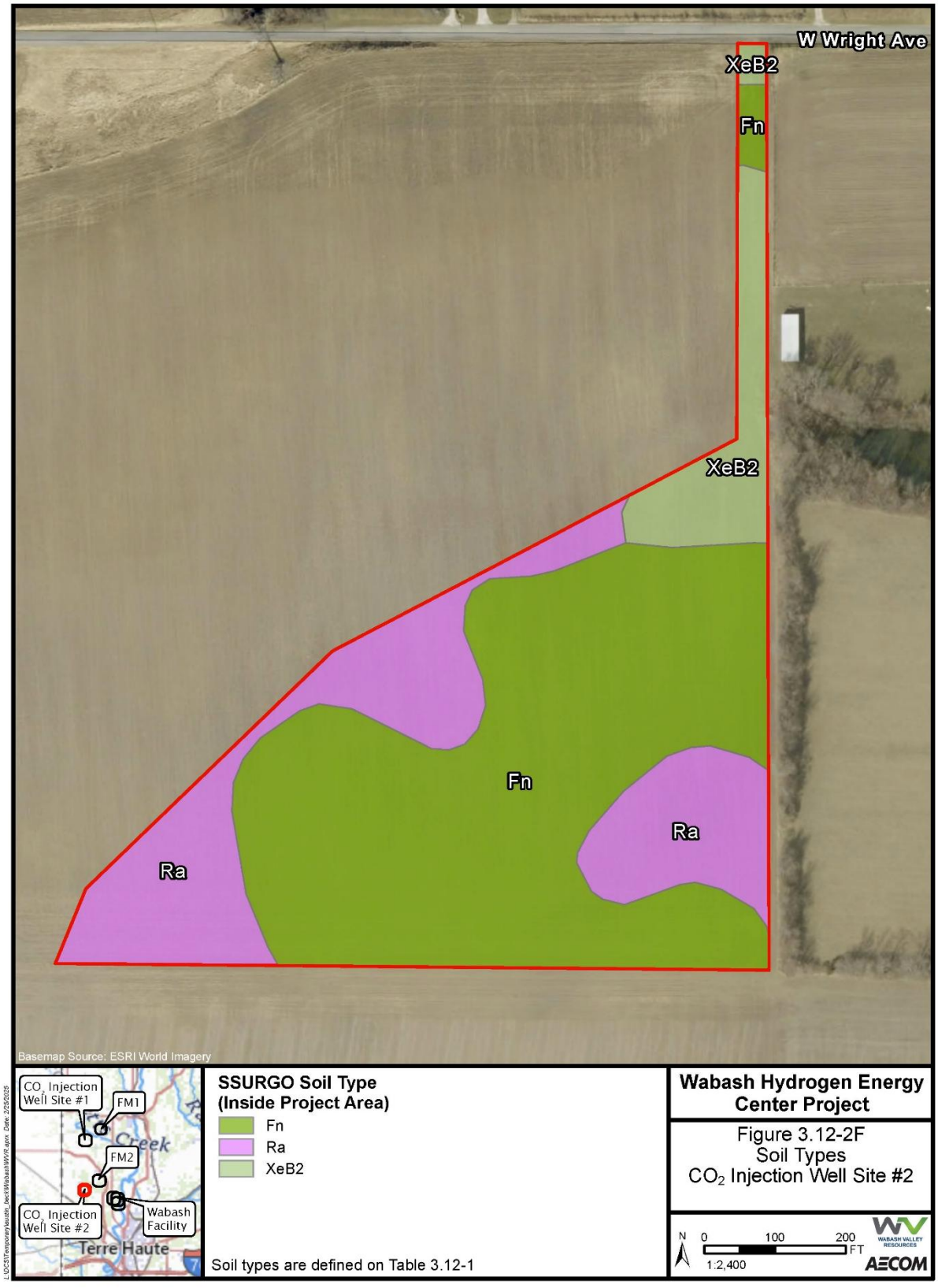


Figure 3.12-2G: Soil Types Formation Monitoring Well #2

3.12.2 Prime Farmland

Soil and farmland classifications are summarized in **Table 3.12-1** and illustrated in **Figure 3.12-3**.

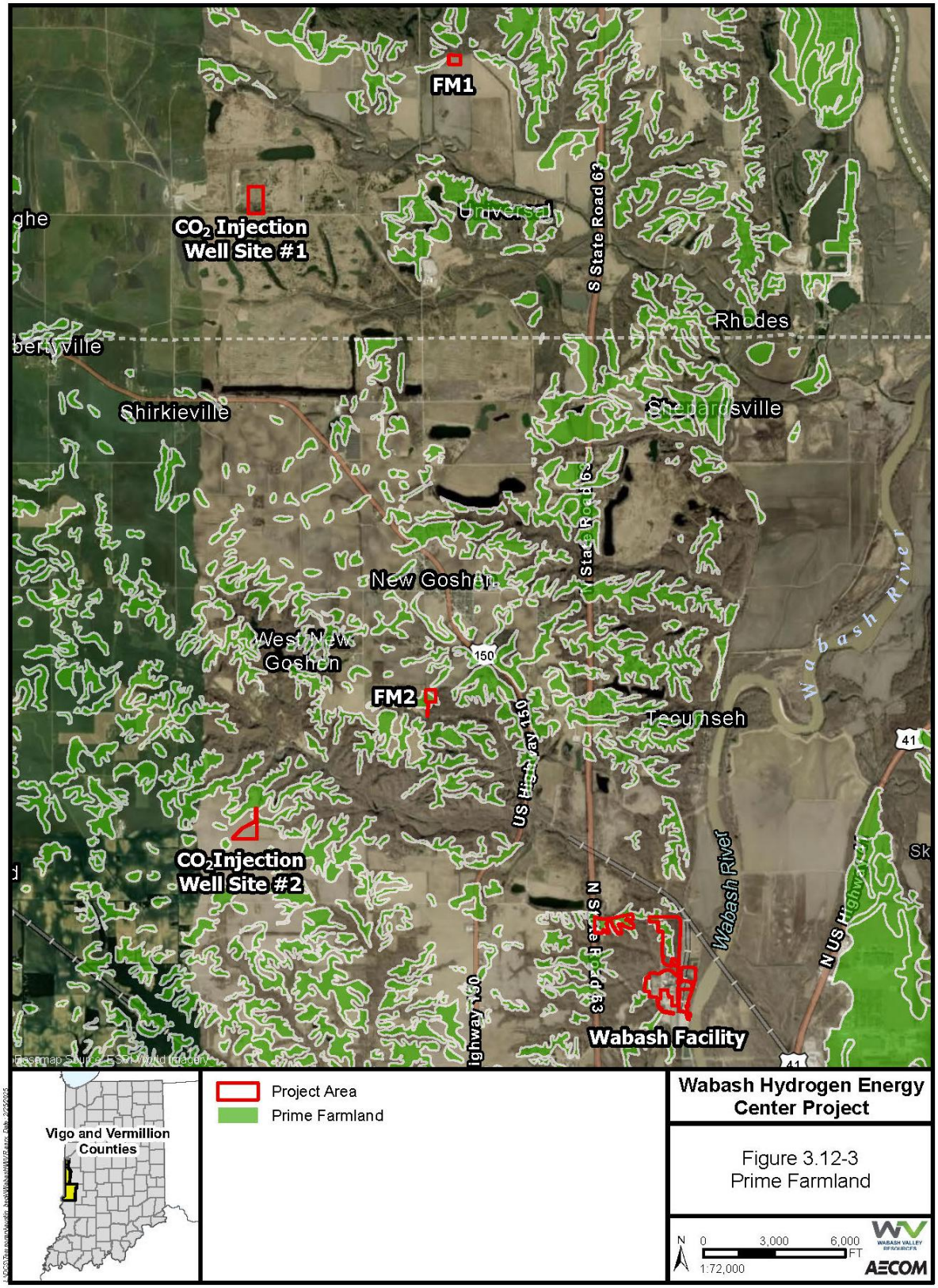
In Vigo County, approximately 89 percent of the existing facility is situated on soils that are not considered prime farmland. The hydrogen production and CO_2 capture facility would be located at the existing WRCGRDP site, most of which would be on ground that was disturbed in the past for previous industrial activity and would be unlikely to have retained characteristics of prime farmland. The ammonia synthesis facility site is currently wooded, not in agricultural use, and zoned M-2 Heavy Industrial. Although approximately 34 percent of this area is mapped as prime farmland and would be affected by the Project, it is not currently available for agricultural use due to non-agricultural zoning. Therefore, the soils mapped by SURGGO as prime farmland at these two locations were not included as prime farmland for this calculation.

Approximately 12.99 acres of the laydown yard/parking area would be situated on land that is mapped as prime farmland and currently in agricultural use; however, this area is zoned as M-2 Heavy Industrial. At the conclusion of construction activities, this land would be returned to its prior owner for use consistent with local land use regulations.

The two CO_2 injection well sites and two FM sites are in areas zoned for agricultural use and currently being used for agriculture (see Section 3.13). CO_2 injection well Site #1 and the FM1 site are in Vermillion County and would not be on soils defined as prime farmland. In Vigo County, portions of CO_2 injection well Site #2 (0.97 acre) and the FM2 site (3.09 acres) would be on Xenia silt loam soils, which are listed as prime farmland. This represents approximately 2.8 percent of the 143.21-acre Project LOD.

Because only a small percentage of the overall Project would be on prime farmland and soils in areas zoned for agricultural use, impacts on prime farmland and soils resulting from the Project would not be significant.

Figure 3.12-3: Prime Farmland



3.13 Land Use

The Wabash Facility would be in the northwest corner of Vigo County in Fayette Township, approximately 1 mile from the closest incorporated area (the town of Spelterville), which is across the Wabash River from the Wabash Facility. CO_2 injection well Site #2 and FM2 would also be in Fayette Township in Vigo County, approximately 3 miles west of the Wabash Facility. CO_2 injection well Site #1 and FM1 would be approximately 7 miles northwest of the Wabash Facility in rural areas of Clinton Township, Vermillion County.

3.13.1 Land Uses in the Project Vicinity

The Project area is characterized by open space and agricultural uses, with industrial uses near the hydrogen production and CO_2 capture facilities, forested areas in the vicinity of the ammonia synthesis facility, agricultural fields at the laydown yard/parking area, and agricultural fields and grasslands at the two CO_2 injection well sites and the two FM well sites. Minor commercial components also occur in areas surrounding the Wabash Facility.

The IDNR Coal Mining Information System indicates past aboveground and underground coal mining within portions of the Project area. The Wabash Facility and FM2 would be in an area with underground mines. CO_2 injection well Site #1 would be within the boundary of the Universal Mine (Surface Mine Number 202017), which is owned by the Peabody Coal Company; operation ended in 1981. This mine extracted primarily coal from the Danville Coal Member, which is about 100 feet deep and 4.6 feet thick. At this same location is the Jackson Hill #6 Mine (Mine Number 800289), which is owned by the Jackson Hill Coal and Coke Company; operation ended in 1939. The other well sites (FM1 and CO_2 injection well Site #2) would not be within past mining areas.

There is one state/county park within 1 mile of the Wabash Facility; there are no state/county parks within 1 mile of any of the CO_2 injection well sites and FM well sites. The Wabash River Conservation Area, located across the river from the Wabash Facility, is managed by the Deer Creek Fish and Wildlife Area. It is part of the larger Wabash River and Sugar Creek Conservation Areas, which begin along a tributary creek at Shades State Park and run south-southwest, stretch across four counties (Montgomery, Parke, Vermillion, and Vigo), and end at Fairbanks Landing Fish and Wildlife Area south of Terre Haute. The Wabash River Conservation Area provides hunting, trapping, fishing, hiking, and boating for the general public.

Two adjacent railroad tracks run from the town of Terre Haute, to the northwest; over the Wabash River; and pass within 0.3 mile of the existing WRCGRDP site and within 0.1 mile of the ammonia synthesis facility. One track is owned by the Canadian Pacific Railroad; the other is owned by the Chicago, Milwaukee, St. Paul and Pacific Railroad. At a point just north of the Wabash Facility, a spur of the Canadian Pacific Railroad track breaks off and runs south, adjacent to the east side of the ammonia synthesis facility and into the existing WRCGRDP site. This abandoned railroad segment was previously used to transport coal to the existing WRCGRDP facility when it was an operating coal power plant. The main segments of the railroad tracks continue north and west until the rails themselves stop between US Highway 150 and State Road 63, but the abandoned railroad right-of-way continues north and west through Vigo County.

Three pipelines exist within 1,000 feet of the Project site. A 20-inch Midwestern Gas Transmission Company natural gas pipeline extends from the existing WRCGRDP site; the line parallels an existing overhead electric transmission line, which also extends from the existing plant. Two 8-inch, parallel Shell Oil Company petroleum product pipelines enter Fayette Township from Otter Township on the east side of the Wabash River, approximately 0.35 mile

north of the existing facility, and continue west and south into Illinois. The main portion of the ammonia synthesis facility would be adjacent to the south side of the lines; the associated security building would be on the north side of the lines.

No wind energy turbines or Federal Communications Commission–regulated cellular towers are within 1,000 feet of the Wabash Facility or any of the CO_2 injection well sites or FM well sites.

Access to hydrogen production and CO_2 capture facilities would be from an existing plant entrance on West Sandford Avenue, north of the existing WRCGRDP. Access to the ammonia synthesis facility site would also be from West Sandford Avenue, just west of the entrance to the existing WRCGRDP facility. State Road 63 to West Sandford Avenue would be the primary access route to the Wabash Facility. Access to the well sites would use existing public roadways. See Section 3.6 for more information regarding transportation in general and CO_2 transport routes.

3.13.2 Zoning

The Unified Zoning Code of Vigo County regulates the improvement of land, buildings, and structures.

- The Wabash Facility is in the Zone M-2 Heavy Industrial District (Beacon 2025). M-2 zoning allows uses related to manufacturing, construction, wholesaling, warehousing, and associated retail; financial and service activities with a need for outdoor storage, processing, or operations; and the establishment of industrial parks. M-2 districts may not be adjacent to residential or light commercial districts. The permitted uses include the types of manufacturing activities that would be conducted at the Wabash Facility. Certain “special exception uses” are permitted if a business is subject to Subpart B Reporting Requirements (40 CFR Section 370.20), as promulgated pursuant to Section 311 and Section 312 of the Community Right to Know Act. Minimum lot widths; frontages; minimum front, rear, and side setbacks; parking; loading; entrances; signage; and outside operations and storage are also regulated. Industrial performance standards regulate glare and heat, vibration, noise, fire and explosive hazards, air quality, water pollution, and industrial sewage and waste (Vigo County 1996).
- CO_2 injection well Site #2 and associated FM2 site are both in the Zone A-1 Agricultural District (Beacon 2025). The A-1 zoning permits, among other uses, grain or livestock production; stables; forest or tree production; pastures; land in a government set-aside reserve program; farmsteads; dwellings for caregivers, receivers of care, or caretakers; uses accessory to agricultural operations on the site; or uses accessory to agricultural operations in the area. The Vigo County Unified Zoning Code does not regulate injection or monitoring wells or appurtenant facilities in Zone A-1 (Vigo County 1996).

The Vermillion County Area Plan Commission has developed maps that identify various zoning areas throughout the county. CO_2 injection well Site #1 and associated FM1 site are in Zone A-1, General Agricultural, which generally permits a variety of agricultural uses, such as crop production, forestry, land conservation, orchards, plant nurseries, the raising of farm animals, tree farms, and vineyards, along with single-family residences. The Vermillion County Unified Development Ordinance (Vermillion County 2025) does not regulate injection or monitoring wells or appurtenant facilities in Zone A-1.

3.13.3 Vigo County Parks and Recreation Master Plan

The Vigo County Parks and Recreation Department prepared a Parks and Recreation Master Plan (Vigo County 2020) to provide natural space, recreational opportunities, and educational

programs for the county. The plan is a 5-year strategy to implement the wants and needs of the public through dedicated passive and active recreational areas. The department manages approximately 2,700 acres within Vigo County and oversees 11 parks with three manmade, historical, and cultural features in Vigo County. None of these are within 5 miles of CO_2 injection well Site #2 or FM2. Those within 5 miles of the Wabash Facility are:

- Bicentennial Park: Dewey Point Trailhead and Wabashiki State Fish and Wildlife Area – approximately 4.5 miles south of Wabash Facility in West Terre Haute
- South Seventh Street Park – approximately 5 miles south of Wabash Facility in West Terre Haute
- Lee Fields Park – approximately 3.5 miles south of Wabash Facility and north of West Terre Haute
- Markle Mill Park (and Markle Mill) – approximately 4.2 miles east of Wabash Facility and northeast of Terre Haute

3.13.4 Impacts on Land Uses

According to the USGS National Land Cover database, the main land cover types within the Project area include developed/industrial/bare land at the hydrogen production and CO_2 capture facilities, forested land at the ammonia synthesis facility, and agricultural land at the laydown yard/parking area and all four well sites (CO_2 injection well Sites #1 and #2, FM1, and FM2). **Table 3.13-1** identifies the acreage of the land use types disturbed by the Project.

Table 3.13-1: Land Use Classifications by Project Site

Project Site	Land Cover Type (acres)					Total (acres)
	Developed/ Industrial/ Bare Land	Agriculture	Forest	Grassland	Open Water/ Wetland	
Wabash Facility						
Hydrogen production and CO_2 capture facilities	39.18	0.09	3.63	2.45	5.98[a]	51.33
Ammonia synthesis facility	4.77	0.24	29.62	2.27	0.00	36.90
Parking yard/laydown area[b]	0.00	14.94	2.72	0.00	0.00	17.66
CO_2 injection well Site #1[b]	0.00	16.65	0.00	0.00	0.00	16.65
FM1	0.32	4.13	0.00	0.00	0.00	4.45
CO_2 injection well Site #2	0.00	11.30	0.11	0.00	0.00	11.41
FM2	0.01	4.56	0.24	0.00	0.00	4.81
TOTAL	**44.28**	**51.91**	**36.32**	**4.72**	**5.98**	**143.21**

[a] *Open water in the area consists of the existing on-site manmade settling ponds.*
[b] *USGS values at this location modified to reflect actual conditions at site assessed by aerial imagery (GoogleEarth) and during on-site biological field surveys in 2024.*

3.13.4.1 Physical Division of Established Communities

The existing WRCGRDP site is currently developed within areas zoned M-2 for heavy industrial uses. The proposed uses are compatible with existing and historical uses on the site and in the

surrounding industrial area. Heavy industrial uses are already present on the site; therefore, development of the Project at this location would not result in new incompatible uses that would form a barrier in the community.

The existing WRCGRDP site is currently enclosed by fencing. New facilities also would be enclosed by fencing; therefore, public access would continue to be limited. The Project would not result in the construction of new roads, highways, or other land uses that would divide existing communities. Development of the new facilities would not result in significant visual barriers to viewsheds within the Terre Haute community (see a more detailed discussion regarding visual resources in Section 3.7).

The ammonia synthesis facility would be located in a currently wooded area adjacent to the existing WRCGRDP facility. Although the land use on this property parcel is not currently industrial, the parcel is zoned for industrial use and adjacent to the existing industrial facility. Therefore, the ammonia synthesis facility would not form a barrier to the community. The ammonia synthesis facility would incorporate additional equipment/structures and a cooling tower and flare that would be less than an estimated 125 feet in height. Although the structures at the ammonia synthesis facility would be an additional visual impact (Section 3.7), viewers are already accustomed to the industrial nature of land uses within this viewshed due to the proximity of the existing WRCGRDP facility.

CO_2 injection well Site #1 would be in an area that was previously used for strip mining; the area has most recently been used for cattle grazing. CO_2 injection well Site #2, FM1, and FM2 would be in agricultural fields. Temporary visual impacts would occur during construction from the approximately 120-foot drill rigs on the four well sites. However, once drilling is complete, aboveground structures at the CO_2 injection well sites would not exceed 15 feet in height; these would add blocky elements to the otherwise natural landscape. Aboveground structures on the monitoring well pads (FM1 and FM2) would include the wellheads and a small marshaling cabinet for electronics at each well pad that would not be more than 8 feet tall. The two CO_2 injection well sites and FM sites would be fenced, and visual barriers and landscaping would be installed to minimize visual impacts.

Due to the factors noted above, the Project would not physically divide an established community.

3.13.4.2 Compatibility with Established and Planned Land Uses

As described above, the Project would entail development of production facilities in a manner that would represent a continuation of the industrial uses on a site that is entirely within an area zoned for, and already partially developed with, industrial uses. Construction would not represent an expansion or intensification of these uses. It would not substantially change the nature or types of uses on the site and would not result in land use conflicts with existing and planned uses in the area.

The Project would not conflict with the Vigo County Parks and Recreation Master Plan because it would not affect any of the established parks and recreational uses within 5 miles of the Wabash Facility. There are no established parks or recreational uses within 5 miles of CO_2 injection well Site #2 or FM2 (Section 3.13.3). The nearest state/county park or recreational area to the Wabash Facility would be the Wabash River Conservation Area, which traverses an area across the Wabash River from the Wabash Facility, approximately 0.3 mile from the existing WRCGRDP facility.

3.13.4.3 Consistency with Adopted Local Plans

Development of the Project would be consistent with the applicable policies of the Vigo County Parks and Recreation Master Plan, which is centered on maintaining and increasing community use of parks and natural areas, including hiking, cycling, backpacking, and nature walks. Development of the Project would not affect any existing or proposed parks or natural areas.

Because of the current industrial land use on the Wabash Facility site, the lack of physical division of established communities, compatibility with established and planned land uses, and consistency with adopted local plans, impacts on land use as a result of the Project would not be significant.

3.14 Reasonably Foreseeable Environmental Effects

In accordance with 42 U.S.C. 4332 (C)(i) and (ii), LPO reviewed the reasonably foreseeable environmental effects that have a reasonably close causal relationship to the Proposed Action and any reasonably foreseeable adverse environmental effects that cannot be avoided should the Project be implemented. This assessment of reasonably foreseeable environmental effects considers the potential impacts of other federal and non-federal projects in the region that could affect the same resources affected by the Project.

The identification of other federal and non-federal projects that could contribute to reasonably foreseeable environmental effects that have a reasonably close causal relationship to the Proposed Action included the identification of projects or actions where there is an existing decision (e.g., decision record or issued permit), a commitment of resources or funding, or a publicly available formal proposal or planning document (e.g., a permit application). It is assumed that all reasonably foreseeable future actions would be conducted in accordance with local, state, and federal laws and regulations as well as BMPs and standards associated with such regulations. Speculative future developments (such as those that are not formally proposed or do not have enough details to inform the analysis) are not included in this analysis. The reasonably foreseeable future actions that may have a close causal relationship were identified through review of publicly available data on relevant websites, as listed below.

- Federal entities, such as the Department of Interior (Bureau of Land Management, USFWS, Bureau of Reclamation), Department of Defense, and USACE
- Tribes
- State agencies
- County and local planning commissions

This review identified the following projects that may result in reasonably foreseeable environmental effects:

- Infrastructure improvements near Terre Haute Regional Airport and the 181st Intelligence Wing of the Indiana Air National Guard, associated with a U.S. Department of Defense Office of Local Defense Community Cooperation grant of $664,875.
- Development of ENTEK Lithium Separators, LLC's, manufacturing facility in southern Terre Haute, associated with a $1.3 billion loan from DOE.
- Potential development of transportation measures (roadway improvements and/or maintenance measures) and noise measures (physical infrastructure and/or operational

measures) associated with execution and implementation of the Mitigation Action Plan (see Appendix G).

LPO reviewed the projects that may result in reasonably foreseeable environmental effects and found that the infrastructure improvements near Terre Haute Regional Airport and the ENTEK facility would not result in environmental effects that would have a reasonably close causal relationship to the Proposed Action and would not affect the same resources affected by the Project.

LPO's review of the potential transportation and noise measures found that development of such measures is reasonably foreseeable and has a close cause relationship to the Proposed Action. The applicant has allocated $5 million to address potential future measures; however, no final design or state and local agency agreements have been established to date. LPO notes that any future development associated with the transportation or noise measures may result in short-term impacts from construction or maintenance activities; however, any transportation or noise measures would be implemented in coordination with pertinent local and state regulations and be subject to standard permitting and environmental compliance requirements. Any transportation or noise measures would be implemented pursuant to the Mitigation Action Plan (see Appendix G) and designed to reduce the effects of the Project; therefore, such measures would not contribute to a significant impact.

4. DRAFT FINDINGS OF NO SIGNIFICANT IMPACT HEADING

Based on this EA, DOE has determined that providing a federal loan guarantee to WVR for the Wabash Facility, the CO_2 injection well sites, and the FM wells (together, the Project) would not have a significant effect on the human environment. This finding includes a commitment by WVR to refine and implement its transportation plan, in consultation with the Indiana Department of Transportation, Vigo County, and Vermillion County and in accordance with applicable state and county requirements, approvals, and ordinances (Transportation Plan). Implementation of the Transportation Plan accounts for both construction and operational workforce transportation as well as the shipments of supplies, raw materials, products, wastes, and CO_2 in its final design. Operation in consultation and coordination with the applicable state and county authorities would mitigate any reasonably foreseeable safety, road maintenance, traffic, and noise impacts that may be associated with Project transportation.

The finding also includes a commitment by WVR to review and implement applicable noise reduction measures and/or operational considerations developed in consultation with relevant state authorities, along with authorities in Vigo County and Vermillion County. Such noise reduction measures, and/or operational considerations, would be developed and applied in accordance with applicable state and county requirements, approvals, agreements, and ordinances (Noise Plan). Implementation of the Noise Plan accounts for both construction and operation of the Project in its final design. Operation in consultation and coordination with the applicable state and county authorities would mitigate potential noise impacts associated with the Project.

The outcomes of future consultation, permit and approval status reports, the final Project design, and any additional transportation and noise studies to be provided by WVR to LPO in accordance with the Mitigation Action Plan (see Appendix G) would enable LPO to monitor progress and ensure that transportation and noise impacts related to Project construction and operation, after implementation of the Transportation Plan and Noise Plan, would not be significant. Preparation of an environmental impact statement is therefore not required, and DOE is issuing this Mitigated Finding of No Significant Impact (FONSI).

5. LIST OF AGENCIES CONTACTED

5.1 Federal

- Federal Communications Commission
- U.S. Army Corps of Engineers, Louisville District
- U.S. Environmental Protection Agency, Region 5
- U.S. Fish and Wildlife Service, Indiana Ecological Services Office

5.2 State

- Indiana Department of Environmental Management
  - Office of Air Quality
  - Office of Water Quality
- Indiana Department of Natural Resources
  - Division of Fish and Wildlife
  - Division of Historic Preservation and Archeology, State Historic Preservation Officer
  - Division of Water
- Indiana Department of Transportation
- Indiana State Chemist

5.3 Local

- Vigo County Government
  - Administrative Branch
  - Planning Department
  - Soil and Water Conservation District
- Vermillion County Government
  - Administrative Branch
  - Zoning Department

5.4 Tribes

- Citizen Potawatomi Nation, Oklahoma
- Forest County Potawatomi Community, Wisconsin
- Hannahville Indian Community, Michigan
- Kickapoo Tribe of Indians of the Kickapoo Reservation in Kansas
- Match-e-be-nash-she-wish Band of Pottawatomi Indians of Michigan

- Miami Tribe of Oklahoma
- Peoria Tribe of Indians of Oklahoma
- Prairie Band Potawatomi Nation
- Seneca-Cayuga Nation

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