

Verbio

Biofuel and Technology

VNA Sumner, LLC

SUMMARY

- ❑ VERBIO is Europe's only industrial-scale producer of biodiesel, bioethanol and renewable natural gas (biomethane) vehicle fuels.
- ❑ VERBIO is Europe's largest renewable natural gas (RNG) producer – sold as **verbiogas** it currently serves 20% of the German market for CNG vehicle fuel. The remaining 80% of the CNG market is served almost exclusively by fossil gas imports.
- ❑ The renewable natural gas industry was created as part of the federal Renewable Fuel Standard which created the ethanol and biodiesel industries.

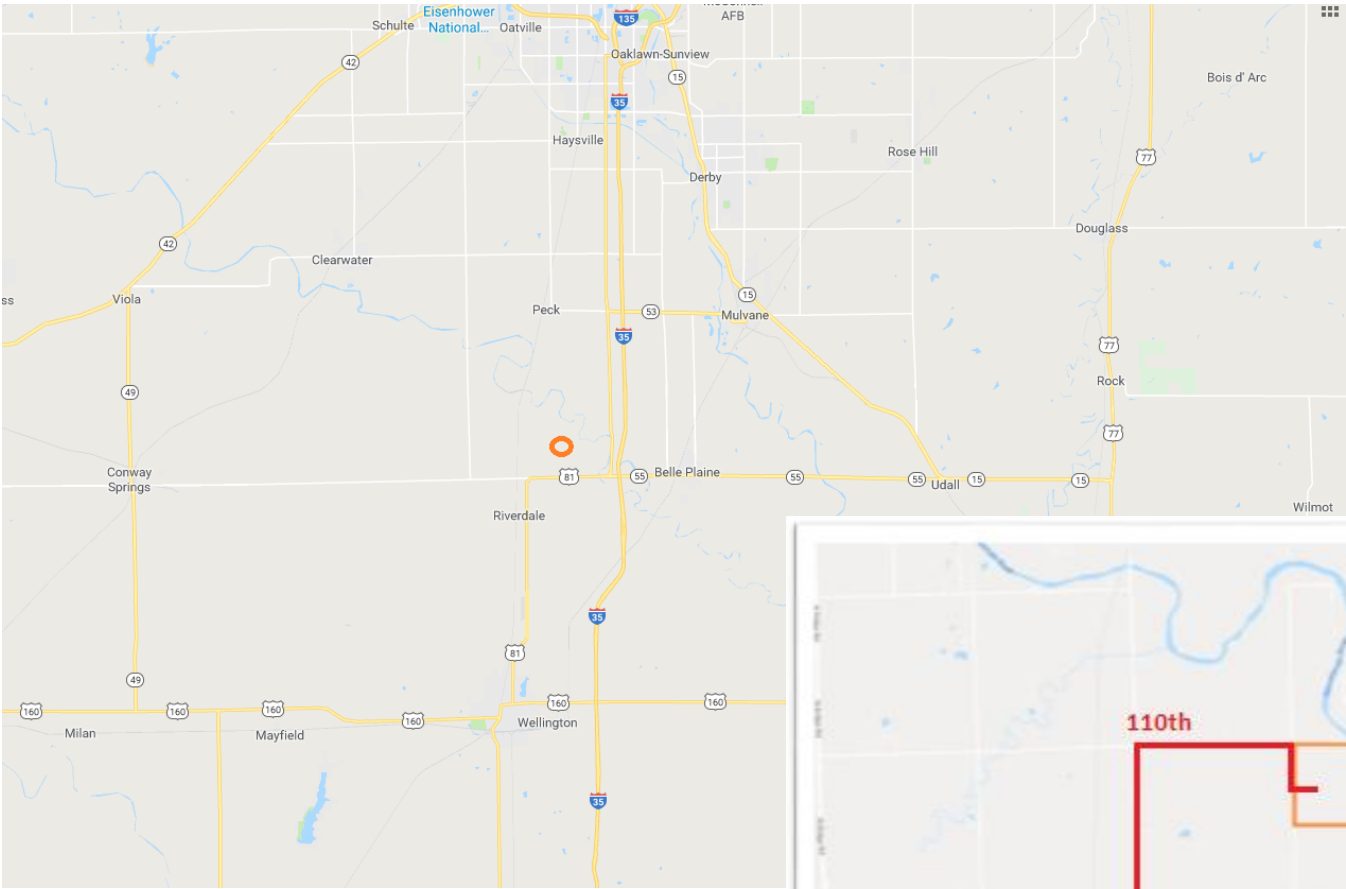
Feedstock

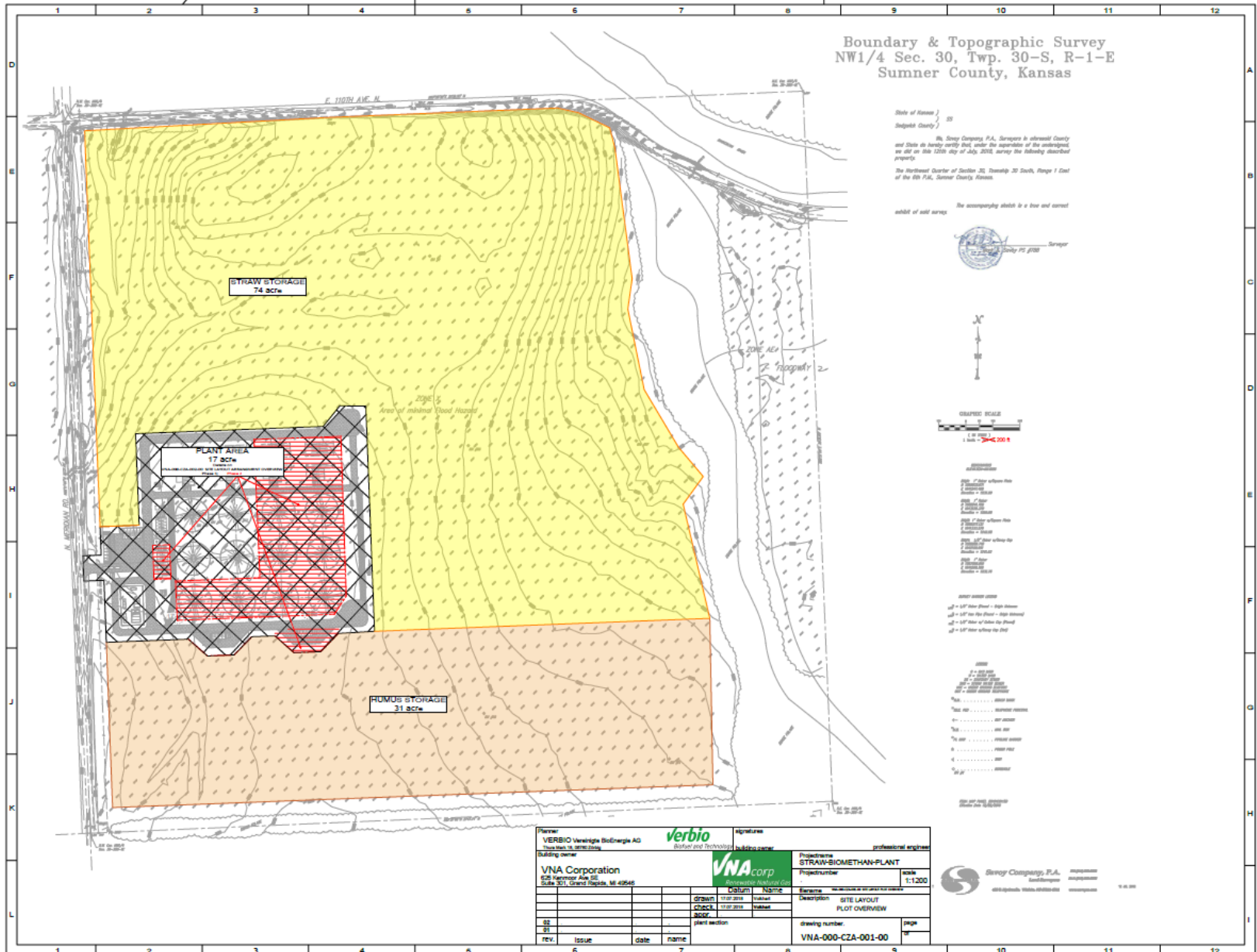
- Initial requirements: ~75,000 metric tons of straw annually
- Target ramp-up capacity to ~150,000 metric tons annually
- ~1.2 tons of humus returned to land per 1 ton of straw
- Preference for farmers to provide storage for straw and humus at fields

Site Selection

- 100+ acre minimum size
- Proximity to a natural gas pipeline and highway infrastructure
- 100+ million annual gallons of freshwater for process input
- Feedstock requirements largely achieved within a 50 mile radius
- Strong local, regional, and statewide support

Plant Location & Route





Continue Farming Excess Land



Site Plan – Phase 1 (2019-2020)

N. MERIDIAN RD. $N02^{\circ}11'40"N, 2637.40'W$

Black Hills Energy Pipeline

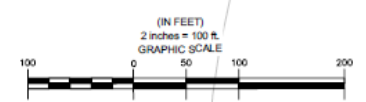
NUMBER	DESCRIPTION	AREA (SF)	MAX LIT (70)
140	RUDD	4.90	71.00
140	RUDD	4.90	87.00
140	STUCK	4.00	149.00

Area of n

-  paved driveways
A: 103,350.00 SF
-  unpaved accesways
A: 17,953.00 SF
-  paved walkways
A: 100 SF

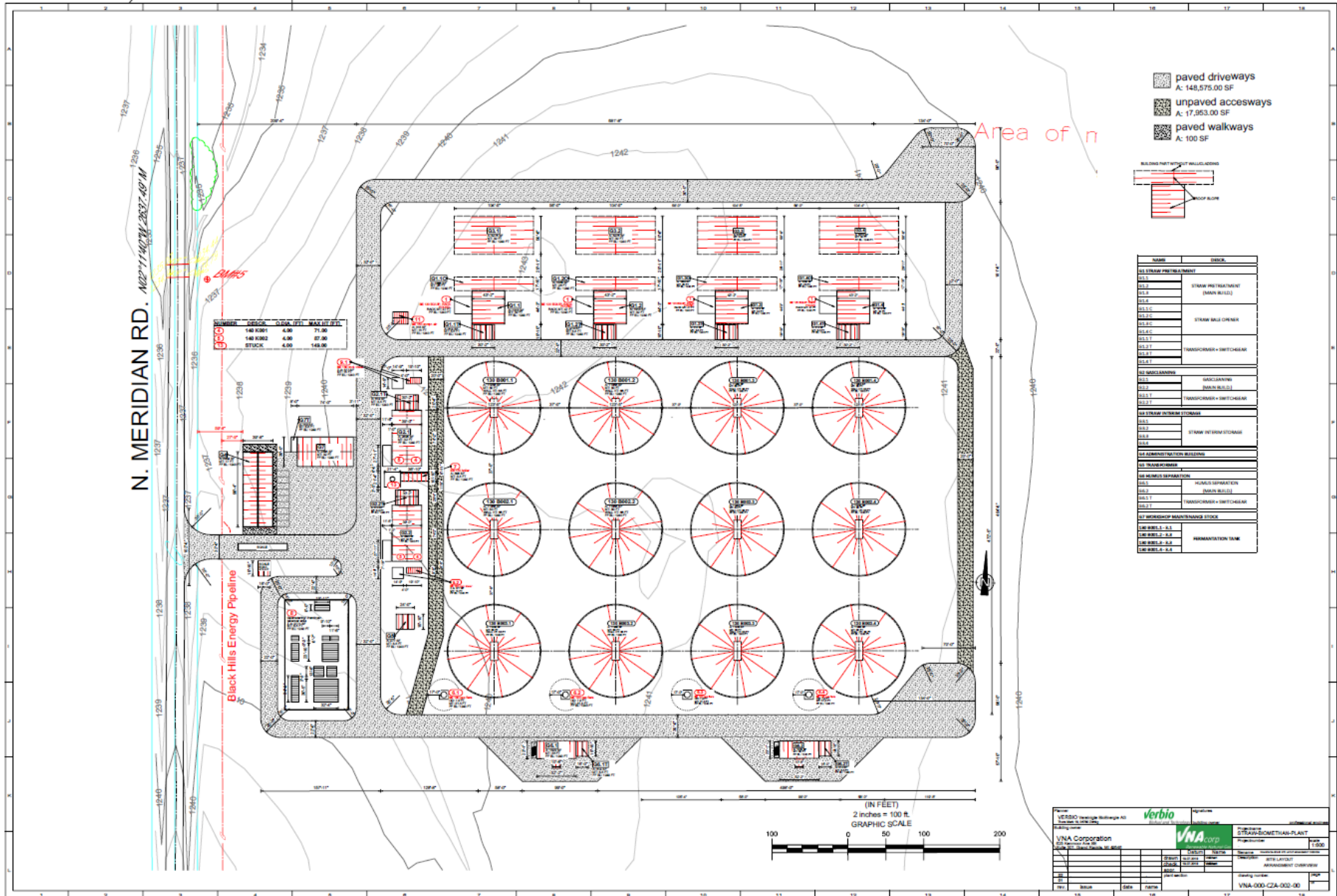


NAME	DESCRIPTION
01	01 STRAW PRE-TREATMENT
01.1	STRAW PRE-TREATMENT
01.2	STRAW BUILDING
01.2.1	STRAW BUILD OPENING
01.2.2	STRAW BUILD OPENING
01.2.3	TRANSFORMER + SWITCHGEAR
01.2.4	TRANSFORMER + SWITCHGEAR
02	02 MANUFACTURING
02.1	MANUFACTURING
02.1.1	TRANSFORMER + SWITCHGEAR
02.1.2	TRANSFORMER + SWITCHGEAR
03	03 STRAW STORAGE
03.1	STRAW STORAGE
04	04 ADMINISTRATION BUILDING
04.1	ADMINISTRATION BUILDING
05	05 TRANSFORMER
05.1	TRANSFORMER
05.1.1	MULTI-LAYERED
05.1.2	TRANSFORMER + SWITCHGEAR
06	06 WRECKSHOP/MANUFACTURED STORAGE
06.1	WRECKSHOP/MANUFACTURED STORAGE
07	07 WRECKSHOP/MANUFACTURED STORAGE
07.1	WRECKSHOP/MANUFACTURED STORAGE
08	08 WRECKSHOP/MANUFACTURED STORAGE
08.1	WRECKSHOP/MANUFACTURED STORAGE
09	09 WRECKSHOP/MANUFACTURED STORAGE
09.1	WRECKSHOP/MANUFACTURED STORAGE
10	10 WRECKSHOP/MANUFACTURED STORAGE
10.1	WRECKSHOP/MANUFACTURED STORAGE
11	11 WRECKSHOP/MANUFACTURED STORAGE
11.1	WRECKSHOP/MANUFACTURED STORAGE
12	12 WRECKSHOP/MANUFACTURED STORAGE
12.1	WRECKSHOP/MANUFACTURED STORAGE
13	13 WRECKSHOP/MANUFACTURED STORAGE
13.1	WRECKSHOP/MANUFACTURED STORAGE
14	14 WRECKSHOP/MANUFACTURED STORAGE
14.1	WRECKSHOP/MANUFACTURED STORAGE
15	15 WRECKSHOP/MANUFACTURED STORAGE
15.1	WRECKSHOP/MANUFACTURED STORAGE
16	16 WRECKSHOP/MANUFACTURED STORAGE
16.1	WRECKSHOP/MANUFACTURED STORAGE
17	17 WRECKSHOP/MANUFACTURED STORAGE
17.1	WRECKSHOP/MANUFACTURED STORAGE
18	18 WRECKSHOP/MANUFACTURED STORAGE
18.1	WRECKSHOP/MANUFACTURED STORAGE
19	19 WRECKSHOP/MANUFACTURED STORAGE
19.1	WRECKSHOP/MANUFACTURED STORAGE
20	20 WRECKSHOP/MANUFACTURED STORAGE
20.1	WRECKSHOP/MANUFACTURED STORAGE



Project Name	VERBIO Technology Building A0	Client	Verbio	Phase	Phase 1
Location	1000 N. Meridian Rd	Project No.	VNA-000-001-001	Scale	AS SHOWN
Design Firm	VNA Corporation	Project Manager	VNA Corp	Site Location	1000 N. Meridian Rd
Project Description	VERBIO Technology Building A0	Project Supervisor	VNA Corp	Design No.	VNA-000-001-001
Sheet No.	001	Sheet Title	001	Design Date	10/20/19
Revision		Revision		Design Status	FOR PERMIT
Author		Checker		Design No.	VNA-000-001-001
Drawn		Design		Design Date	10/20/19
Check		Design		Design Status	FOR PERMIT
Issue		Design		Design No.	VNA-000-001-001
Scale		Design		Design Date	10/20/19
Notes		Design		Design Status	FOR PERMIT

Site Plan – Expanded Facility (2021+)



Project:	VERBIO Strategic Multi-Phase A1	Verbio	Signature:	
Client:	VNA Corporation	VNA Corp	Project Name:	STRAIN-SEPARATION-PLANT
Scale:	2" = 100'		Revision:	
Author:			Checked:	
Designer:			Approved:	
Checker:			Date:	
Project No.:	VNA-000-CZA-002-00		Sheet No.:	1256

- 1 Farmers generate a new revenue stream – sale of wheat straw, corn stover and cover crops (\$3.5+ million/year during Phase 1)
- 2 Humus returned to the land – nutrients and water retention
- 3 Each facility requires a final investment of \$100+ million and creates 75+ direct full time jobs and 150+ indirect jobs in the supply and value chain



Process Overview

Straw



Anaerobic
digestion



verbiogas



CNG/LNG
vehicle fuel



Humus
soil
amendment



Renewable Natural Gas

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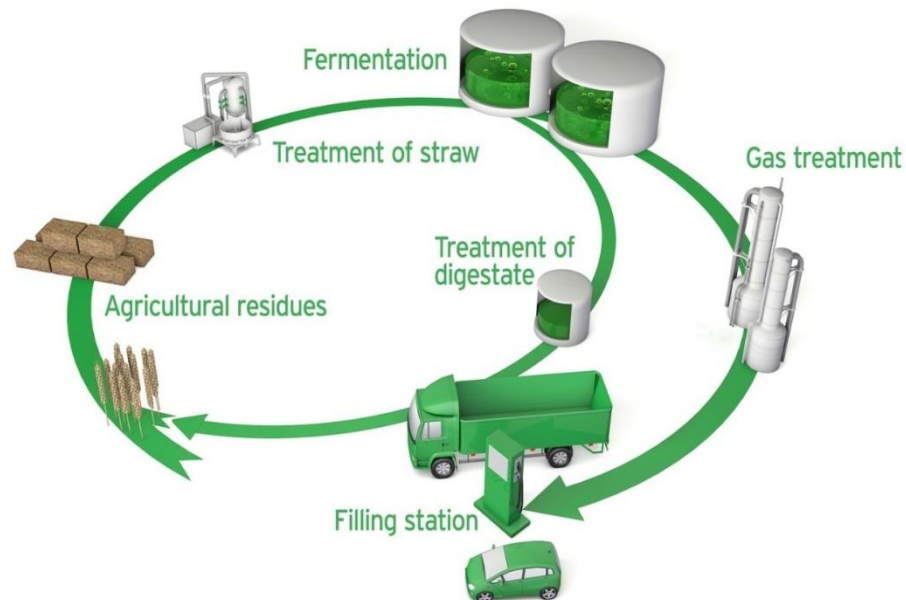
Existing VERBIO Facilities



Existing VERBIO Facilities



- Oct 2018** Finalize permits and authorizations
- Nov 2018** Begin site excavation and foundation improvements
- Mar 2019** Begin tank construction
- Jun 2019** Begin building construction
- Oct 2019** Complete tank construction
- Dec 2019** Complete electrical, piping, and equipment installation
- Jan 2020** Begin Phase 1 operations
- Jan 2021** Begin expansion of facility



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QUESTIONS?

FREQUENTLY ASKED QUESTIONS – VNA SUMNER, LLC

What is VNA SUMNER, LLC?

This is the operating entity for the industrial project planned for the unofficial address of 1080 N. Meridian Road, Peck KS 67120, on a 160-acre site currently used as farmland. The entity is expected to eventually support 75+ full time direct jobs and another 150+ indirect jobs in the supply and value chain.

Who is developing and financing this project?

VNA Corporation (Grand Rapids, MI) is developing this project using proprietary technology provided by VERBIO Vereinigte BioEnergie AG, a leading producer of biofuels in Germany. VERBIO is providing all project financing for Phase 1 of construction. No public financing, federal grants or bank loans have been sought. Phase 1 is the 2018-2019 construction project followed by operations in 2020. In 2021 and beyond we hope to gradually expand the facility based on local availability of feedstock supply.

What are your process inputs?

We only use baled crop residues and water as our process inputs. Initially during Phase 1, these crop residues will be 75,000+ tons per year of wheat straw and corn stover, but over time we will be interested in other cellulosic material such as tall grasses and immature cover crops. We will never use manure or food waste in our process.

What are your process outputs?

We produce renewable natural gas (RNG) and humus. RNG will be cleaned to pipeline natural gas standards and injected into a nearby natural gas transmission pipeline for eventual use as CNG/LNG vehicle fuel. (RNG is sold under the same federal program that created the ethanol and biodiesel industries.) Humus is a lignin- and nutrient-rich soil amendment similar to peat moss or compost which will be principally returned to feedstock suppliers, with the balance sold commercially.

Will the site be noisy?

Noise generating equipment such as compressors, mixers, and straw grinding systems will be contained within buildings. There will be noise associated with heavy truck traffic which is unavoidable.

What will be the impact on air quality?

We will have a natural gas fired boiler on site to provide heat and a thermal oxidizer to clean the CO₂ we emit. We will also have a safety flare on site to burn renewable natural gas in the event of an emergency shutoff to the pipeline or malfunction. We are not burning straw!

FREQUENTLY ASKED QUESTIONS – VNA SUMNER, LLC

Will there be noxious odors?

We do not use any odorous material feedstock in our process. We only use baled crop residues such as wheat straw and corn stover – the majority of which will be stored off-site and must remain relatively free from rot and degradation to support our process. Our byproduct – humus – has a smell similar in character to peat moss or compost and will be trucked to and stored on farmland for land application.

What is the traffic pattern?

Trucks will come to the site entering off Highway 81, traveling 2 miles north via N. West Rd., then 1 mile east via E. 110th Ave. N., and finally south ¼ mile along N. Meridian Rd to the plant entrance. Trucks will only haul feedstock and humus between the hours of 6 AM and 10 PM except during the harvest season. During Phase 1 there will be 15-25 trucks per day during most of the year and up to 50 per day during the brief wheat straw harvest season. We are conducting a traffic impact study under the direction of KDOT to assess required road improvements for access off Highway 81.

What are your water requirements?

Water supply is critical to our operation and we will use an average of 100 gallons per minute (50 million gallons per year) during Phase 1. We are currently conducting hydrogeologic exploration and test drilling on the site and will use the results to apply for a new water right through the Kansas Division of Water Resources (KS-DWR). Our preference would be to take all water supply as groundwater/well-water. If this supply is insufficient, we will also evaluate capturing water via a rainwater retention pond and/or surface water from the Ninnescah River as a diversified supply strategy. If KS-DWR ultimately does not approve our application for a new water right, or does not approve the volumes we require, we will not build a plant at this location.

Do you create wastewater?

Our process does not create any wastewater. The water we use is ultimately returned to farmland as moisture content in the humus, after being recycled through our process to the maximum extent possible. In the rare event of a spill or leak there are no public health concerns.

Will I still be able to see the stars at night?

We hope so! Perimeter lighting will only be designed to support minimum security and operational requirements. Consideration will be given to the placement and positioning of lighting to minimize the impact on our neighbors to the north. We will also farm the northern-most portion of the parcel to create an aesthetic buffer between our plant and neighbors.