

U.S. Environmental Protection Agency Region 5

Purpose: Industrial User Pretreatment Compliance Inspection

Facility: Green Plains Mount Vernon LLC
8999 W Franklin Road
Mount Vernon, IN 47620

Inspection Date: February 23-24, 2021

EPA Representatives:

Rajen Patel, Environmental Engineer, 312-886-5741
Cheryl Burdett, Environmental Scientist, 312-886-1463

Facility Representatives:

Daniel Labhart, Plant Manager, 812-270-1411
Ryan Rezac, Water & Waste Compliance Manager, 402-952-4839
Chelsea Holscher, Lab Manager, 812-890-8844
Sarah Oskins, Senior Lab Technician & Wastewater Operator, 812-454-5648

Report Prepared by:

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Inspector Signature: RAJEN PATEL Digitally signed by RAJEN PATEL
Date: 2021.04.27 18:43:41 -05'00'

Approver Name and Title: Ryan Bahr, Chief, Section 2
Water Enforcement and Compliance Assurance Branch

Approver Signature And Date: RYAN BAHR Digitally signed by
RYAN BAHR
Date: 2021.04.27
19:02:49 -05'00'

BACKGROUND

The purpose of the inspection was to describe, evaluate, and document compliance with the Clean Water Act (CWA) and associated pretreatment regulations with respect to the Green Plains facility located at 8999 West Franklin Road, Mount Vernon, Indiana 47620 (the facility).

There are two entities (Approval and Control Authority) that have the responsibility to develop and implement the federal pretreatment program.

An Approval Authority is either the state Director of a National Pollutant Discharge Elimination System (NPDES) in an authorized state with an EPA-approved pretreatment program or the EPA Regional Administrator in a state without an approved pretreatment program. A Control Authority is either a Publicly Owned Treatment Works (POTW) with an approved pretreatment program or the Approval Authority for any POTW that does not have an approved program.

The State of Indiana and City of Mount Vernon POTW do not have an EPA-approved pretreatment program. EPA is the “Control Authority” in Indiana and has the enforcement authority pertaining to the pretreatment requirements at Green Plains.

This ethanol manufacturing facility is authorized to discharge in accordance with effluent limitations, monitoring requirements and other conditions set forth in the NPDES Permit (Permit Number IN0063096) issued by the Indiana Department of Environmental Management (IDEM). The facility discharges into the unnamed ditches to the Ohio River. The current permit is valid through July 31, 2024.

The facility’s stormwater is regulated under its NPDES discharge permit - IN0063096 requiring the facility to monitor and comply with non-numerical limits. The facility has an IDEM approved Stormwater Pollution Prevention Plan (SWPPP). The permit requires the facility to sample (from both outfalls) and report its stormwater analysis biannually.

EPA has developed nationally applicable pretreatment standards under CWA section 307(b) in its General Pretreatment Regulations for Existing and New Sources of Pollution at 40 CFR Part 403. Such pretreatment standards are directly applicable to indirect dischargers based on the processes conducted at the facilities and the applicability of those standards. Green Plains discharges to the City of Mount Vernon’s Publicly Owned Treatment Works (POTW).

The applicable technology-based standards for the production of ethanol are contained in 40 CFR 414 – Organic Chemicals, Plastics, and Synthetic Fibers; Subpart F – Commodity Organic Chemicals Point Source Category.

SITE INSPECTION

Opening Conference

EPA representatives entered the facility at 2 pm on February 23, 2021. We signed in at the reception desk and were greeted by Daniel Labhart, Plant Manager at the facility.

Mr. Labhart then escorted us to a common sitting area for an opening conference with him, Ryan Rezac, Water & Waste Compliance Manager and Sarah Oskins, Senior Lab Technician & Wastewater Operator. The EPA inspection team presented credentials to the facility representatives and began the opening conference at 2:40 pm. I explained to the representatives that EPA was performing the CWA compliance evaluation inspection of the facility operations and we would evaluate its wastewater discharges and take photos during the inspection. I also mentioned that confidential business information (CBI) may be declared for materials reviewed during the inspection. I informed the Green Plains representatives that they would receive copies of the photographs collected during the inspection as an attachment to the inspection report. The opening conference began with general questions about the facility's background, manufacturing processes, any applicable wastewater treatment process, and compliance reporting history.

Facility Background

I asked Mr. Labhart about the nature of products and the company's history of operations. He stated that Green Plains Inc., is an Iowa corporation, founded in 2004 as a producer of low carbon fuels and that Green Plains acquired this facility from Abengoa Bioenergy in 2016. Green Plains Inc., owns and operates 12 biorefineries in Indiana, Illinois, Iowa, Minnesota, Nebraska, and Tennessee with total US Capacity to produce 1.0 billion gallons of biofuels annually.

Green Plains Mount Vernon, LLC (Green Plains) is classified under Standard Industrial Classification (SIC) Code 2869 – Industrial Organic Chemicals, Not Elsewhere Classified. The facility manufactures fuel-grade ethanol, distillers grains, and corn oil. Green Plains has the capacity to produce a maximum of 90 million gallons of denatured fuel-grade ethanol per year. Using corn as a feed stock, the starch is converted to sugars, and then the sugars to ethanol. The ethanol is then blended with a denaturant (natural gasoline) to render the final product unfit for consumption. A map showing the location of the facility is attached as Attachment 2/Figure 1.

Mr. Labhart stated that Green Plains operates three shifts per day, seven days a week, with two scheduled shutdowns (spring and fall) for maintenance and process modifications. Mr. Labhart added that 52 employees work at the facility and their production remains steady for the most part throughout the year.

Process Description

Ethanol, also known as ethyl alcohol or grain alcohol, is a colorless liquid produced by fermenting carbohydrates found in a number of different types of grains, such as corn. Ethanol is a significant component of the biofuels industry, which includes all transportation fuels derived from renewable biological materials. This facility is equipped with an ICM ethanol processing technology – also used across other Green Plains Inc.'s biorefineries in the US.

Incoming utility water is supplied from on-site groundwater wells. The well water is prepared for use by chlorination, oxidation, and filtration. After the water is prepared, it is held in storage tanks and directed to either the cooling tower or the Reverse Osmosis (RO) system for further treatment. From the RO system, water is sent to a softener system, which provides the make-up water for the ethanol manufacturing process.

Corn is received at the plant by truck or rail then weighed and unloaded into a receiving building. Grain storage facilities are used to inventory grain that is passed through a scalper to remove rocks and debris prior to processing. The corn is then transported to a hammer mill where it is ground into flour and conveyed into a slurry tank for enzymatic processing. Water, heat, and enzymes are added to convert the complex starch molecules into simpler carbohydrates. The slurry is heated to reduce the potential of microbial contamination and pumped into a liquefaction tank where additional enzymes are added. Next, the grain slurry is pumped into fermenters, where yeast, enzymes, and nutrients are added, and the fermentation process is started. A beer column, within the distillation system, separates the alcohol from the spent grain mash. The alcohol is dehydrated to 200-proof alcohol and either pumped into a holding tank and blended with approximately 2% denaturant as it is pumped into finished product storage tanks or marketed as undenatured ethanol.

Distillers Grains: The spent grain mash is pumped from the beer column into a decanter-type centrifuge for dewatering. The water, or thin stillage, is pumped from the centrifuge into an evaporator, where it is concentrated into a thick syrup. The solids, or wet cake, that exit the centrifuge are conveyed to the dryer system and dried at varying temperatures to produce distillers grains. Syrup is reapplied to the wet cake prior to drying to provide additional nutrients. Distillers grains, the principal co-product of the ethanol production process, are used as high-protein, high-energy animal feed and marketed to the dairy, beef, swine, and poultry industries.

Three forms of distillers grains, depending on the number of times the solids are passed through the dryer system: a) wet distillers grains, which contain approximately 65% to 70% moisture, have a shelf life of approximately three days and is therefore sold to dairies or feedlots within the immediate vicinity; b) modified wet distillers grains, which is dried further to approximately 50% to 55% moisture, have a shelf life of approximately three weeks and are marketed to regional dairies and feedlots; and c) dried distillers grains, which have been dried more extensively to approximately 10% to 12% moisture, have an almost indefinite shelf life and may be stored, sold and shipped to any market.

Corn oil: Corn oil systems extract non-edible corn oil from the thin stillage evaporation process immediately before the production of distillers grains. Corn oil is produced by processing the syrup through a decanter-style, or disk-stack, centrifuge. The centrifuges separate the relatively light corn oil from the heavier components of the syrup. Green Plains extract approximately 0.7 pound of corn oil per bushel of corn used to produce ethanol. Industrial uses for corn oil include feedstock for renewable diesel, biodiesel, livestock feed additives, rubber substitutes, rust preventatives, inks, textiles, soaps, and insecticides. The syrup is blended into wet, modified wet or dried distillers grains. Most of the water used in an ethanol plant is recycled in the production process.

The facility was not in operation during the EPA inspection. On January 11, 2021, the facility sent a letter to IDEM about an extended period shutdown to accommodate the annual maintenance and significant construction improvements associated with the “continuous-to-batch-fermentation” conversion process. I requested Mr. Labhart to provide details of all the

planned and current “process changes.” In his February 26, 2021 letter to me, Mr. Labhart provided information pertaining to ongoing process modifications to the facility operations: mainly the 1) Batch Fermentation Conversion, and 2) P24 Distillation.

Batch Fermentation Conversion: Prior to January 2021, the facility operated as a continuous fermentation plant with a continuous fermentation configuration where fermentation never stops. Milled corn, yeast, and water are added at regular intervals and these materials move continuously through each of the six fermentation tanks. The facility planned to convert to a batch fermentation configuration after the inspection (early March 2021). Under batch fermentation, each of the six fermentation tanks (1-million-gallon capacity) gets filled with the milled corn, yeast, and water and these materials are allowed to ferment in these individual tanks until fermentation is completed. Then the solids and alcohol are extracted from each fermenter and routed for additional processing. The fermenter is then cleaned and sterilized for the next batch. Mr. Labhart explained that the batch process is currently a predominant fermentation method in the fuel-grade ethanol industry, which provides a higher alcohol content and better infection controls. Batch process set up is less susceptible to contamination compared to the continuous set up.

Project 24 Distillation: P24 distillation is an approximate half/half combination of steam (pressure) and vacuum applied distillation as opposed to all pressure induced distillation for the continuous process. Vacuum induced distillation can run at low temperatures and it would consume 30% less electricity and would also reduce the cooling water blow down temperatures.

Stormwater: The facility’s stormwater sampling and monitoring requirements are identified at Outfalls 001S and 002S. The total drainage area contributing to the outfalls is approximately 200 acres. The SWPPP is intended to document the selection, design, installation, and implementation (including inspection, maintenance, monitoring, and corrective action) of control measures. The SWPPP must be kept up-to-date, and modified when necessary, to reflect any changes in control measures that were found to be necessary to meet the non-numeric effluent limits set forth in Part 1.D of the IDEM permit. There are no known stormwater changes associated with the current plant modifications described above.

A schematic flow diagram of the entire production process (with the updated fermentation and distillation system) was not available at the time of the inspection. I asked Mr. Labhart to provide the updated schematics of the revised production process and updated water mass balance diagram when available.

Facility Walk-Through

Chelsea Holscher, Lab Manager, joined us during the site walk-through on February 24, 2021. We began the walk-through at 9:15 am. Ms. Holscher escorted us to the on-site laboratory located north of the office building and showed us the sampling containers, instruments used for on-site analysis, the refrigerator for the sample storage (photos 1 through 5), and the chain-of-custody log folders. We proceeded to the control room office adjacent to the laboratory (photos 6 thru’ 7), where multiple large screen monitors track the entire production process at the facility.

Mr. Labhart escorted us to Ethanol Storage, Denaturing Tank, and Shifter Tank area located south of the truck loading area on the southwest side of the facility (photo 9). These 7 tanks are housed in a large rectangular diked area to contain any spill. I asked Mr. Labhart if the facility has had any such product spillage in this diked area since its 2016 acquisition and he confirmed that the facility has not had any spill in the diked area. While at this location, we inspected the Ethanol and Corn Oil Truck Loading Area (photo 10). Mr. Labhart stated that the spill during loading of the ethanol or corn oil would flow to the drain at the Truck Loading Area (photo 12) and flow through underground piping to the Spill Containment Area (photo 11).

We then proceeded to the first step of grain receiving area (photo 13), where grains are received via rail cars (photo 14). We noticed Corn oil storage near the rail lines without secondary containment (photo 17).

Ethanol is filled in the rail cars from the top. Mr. Labhart stated that they have not had ethanol spill at the rail lines and there have only been rare occurrences of corn oil spills, which are first captured in the catch basin on the rail lines (photo 19). The facility has a dedicated containment area (located between the rail track and fence) to capture any corn oil and ethanol spills (photo 20), which would pump off any spill collected from the containment area for off-site disposal.

The inspection continued towards the east of the facility. We passed through two large corn storage bins and the flour mill area (photo 14). We then proceeded to inspect the above ground chemical Storage area (center of the facility – south of the cook building). It houses Phosphoric Acid, Sulfuric Acid, and Anhydrous Ammonia (photos 21 & 22) stored within concrete containment. Since these tanks are stored outside, they are exposed to stormwater. Mr. Labhart stated that the visible contaminated stormwater is rainwater and dust and is free from chemicals. He stated that it is disposed of in accordance with the facility's Spill Prevention, Control, and Countermeasure (SPCC) plan and all chemical deliveries occur via hose connections between the transfer location and the tank under the supervision of an employee. The chemical delivery area is paved and sloped. In the event of a spill, it would be noticed immediately, mitigated, and disposed of in accordance with the SPCC plan. The concrete catch basin was epoxy coated to contain potential hose drips/leaks during chemical transfer.

Drains within the cook building (photo 24) collect water from the floor washing to an underground holding tank, which would pump the water (photo 25) to the digester tank T-7002. Antibiotics used for fermentation are stored in the Cook Building (photo 26).

The inspection continued to the mixing pond area located on the southeast side of the facility. Aeration sprinklers have been installed in small and larger mixing ponds for further cooling of non-contact boiler and cooling tower blowdown water (photos 27 thru' 29). Grab samples are collected from one of the two locations prior to discharge from Outfall 001S (photos 30 & 31).

Stormwater from the eastern portion of the industrial section is diverted above ground via drainage conveyances to a retention basin (underground) southeast of the six large fermentation tanks (photo 32), to allow infiltration and settling of solids prior to discharging from stormwater Outfall 001S. A normally closed gate valve (photo 29) mitigates the probability of unintentional

discharges from stormwater Outfall 001S. The discharge from Outfall 001S enters a dry creek which flows west, southwest, and ultimately south until it discharges into an unnamed tributary to the Ohio River (south of the facility).

We walked past the six large (1 million-gallon each) Fermentation Tanks (photo 32). Prior to 2021, these tanks were operated as continuous fermentation. Mr. Labhart stated that these tanks will operate as batch fermentation tanks after March 2021. They will remain at their existing locations. Each tank is currently being upgraded and retrofitted to the batch operation.

Mr. Labhart escorted us to the Distillation Area, Beer Well, Evaporation Tanks, Eductor Tank area (photo 34) and cooling towers (3 chillers – photo 36). On our way to these process areas, we noticed an oil sheen in the stormwater culvert located east of the cooling tower. I asked Mr. Rezac for the potential source of the oil and he stated that the source could have been from the parked maintenance vehicles near the culvert. Mr. Rezac mentioned that the oil sheen couldn't have resulted from the non-contact sump pump malfunctioning (as they have in the past), since the plant was not in the operation at that time.

The inspection continued towards the wastewater treatment system (aerobic digester) located on the northeast side of the facility (photos 37 thru' 41). Mr. Labhart stated that the discharge from Outfall 001 consists of filter backwash and filter-press wastewater, RO reject water (photo 53), softener regenerant, boiler blowdown, non-contact cooling water, and condensate from heat exchangers, as well as storm water. The outfall has an average discharge of approximately 0.95 million gallon per day (MGD) into the unnamed ditch to the Ohio River.

Mr. Labhart stated that the discharge from Outfall 002 (discharges into the unnamed ditch to the Ohio River) consists of treated process wastewater from the ethanol production as well as storm water. Wastewater from the ethanol process is sent to a 750,000-gallon Equalization Tank (T-7001) followed by the wastewater holding tank T-7002 (photo 43). From there, the wastewater is fed to the wastewater treatment system (digester) consisting of aeration, flocculation, and clarification. The wastewater treatment system had an average discharge of approximately 0.36 MGD. Due to recent plant modifications, wastewater discharges from the new batch fermentation and P24 distillation would be significantly reduced. The batch process is a net "water negative" system. The continuous process ran as a "water positive" system. The batch process consumes more water in the process and discharges less. The wastewater digester will remain shut down and will be eliminated from the process when the facility starts to use the batch process. Mr. Labhart stated that the facility is in the process of procuring a vendor to empty and clean the digester. We inspected the wastewater discharge sampling collection point at the bottom of the Digester (photo 42), which is out of commission at present.

The inspection continued to the northwest side of the facility where we inspected outfall, discharge, and sampling locations for Outfall 002 and Outfall 002S (photos 44, 48, 49). Before we ended the facility walk-through, we inspected the Wet Distillers Grains storage area (photo 45) and the newly installed evaporator and beer well (photo 51). Finally, we entered the energy center building to inspect the flow meter that measures the flow from RO reject water, softener regenerant, boiler blowdown, non-contact cooling water and condensate from heat exchangers

leading to Outfall 001. Mr. Labhart provided the attached water mass balance diagram prepared by Weas engineering, which reflects the mass balance for the continuous process.

After completing the facility walk-through portion of the inspection, Mr. Labhart escorted us to office meeting room for the closing conference.

Closing Conference

We began the closing conference at 1:30 pm with Mr. Labhart and Mr. Rezac. We discussed the three primary areas of concern as follows:

[1] *Non-Contact Water Temperature Discharge Plan:* During January 2018, the facility had 10 temperature exceedances, 1 in March 2019, five in January 2020, and two in January 2021 at Outfall 001. Mr. Labhart stated that the non-contact water discharge temperature has been a challenge during January and February each year. In an effort to curb annual temperature exceedances from the boiler and cooling tower blow downs, the facility constructed a quarter acre containment pond in December 2018, installed a heat exchanger in 2019, and added aeration fountains in 2020 to enhance ambient cooling prior to discharge at Outfall 001. Mr. Labhart stated that the facility plans to add larger fountains in March this year. With the reduction of 1 boiler and change in distillation process, Mr. Labhart expects that the facility would come into compliance for temperature at Outfall 001 by next winter.

[2] *Continued Effluent Exceedances:* Review of the DMR records showed an average of one or two zinc, lead, TSS, and BOD exceedances annually. Mr. Labhart stated that the wastewater digester has been eliminated from the process. He stated that the net “water negative” batch fermentation process and elimination of the aerobic digester would result in significant volume reduction of discharge water to the permitted Outfall 002. Mr. Labhart stated that the facility expects significant reduction in TSS, metals, and BOD discharges.

[3] *High Sulfate Results:* During May 2020, extremely high levels of total sulfates were reported on the DMR for the first time (752% higher than the daily maximum). Mr. Labhart stated that the normal sulfate level in the supply water wells is around 94 ppm. During last May, the sulfates in the supply water well tested at 250 ppm. The facility’s contractor, Ortman Drilling, pressure blasted each well to loosen biological growth, cleaned the side walls of solids, chemically cleaned each well, and installed a liner in well C to prevent contamination. The Sulfate results dropped down to an average range of 94 ppm and the DMR data for the last 2 quarters of 2020 did not show any sulfate violations.

During the closing conference, we had not discussed the concern related to the oil sheen observed in the stormwater culvert located east of the cooling tower. Mr. Rezac stated that the

source could have been from the parked maintenance vehicles near the culvert and that he would look into preventing similar occurrences in the future.

We ended the closing conference and departed the facility at 2 pm.

List of Attachments

- I. Inspection photographs
- II. Aerial View of the entire Facility and photolog locations
- III. Map of the facility
- IV. Facility Stormwater Drainage Diagram
- V. Current Water Mass Balance Diagram

Green Plains Mount Vernon, LLC
8999 West Franklin Road
Mount Vernon, Indiana 47620
NPDES Permit IN0063096

Photos Taken by Cheryl Burdett Olympus Tough F2.0



Photo Number: P2240001

Description: Green Plains Mount Vernon laboratory

Location: Onsite laboratory

Facing: Northwest

Date/Time: 02/24/2021 10:52 AM



Photo Number: P2240002

Description: Another photo of the laboratory

Location: Onsite laboratory

Facing: West

Date/Time: 02/24/2021 10:52 AM



Photo Number: P2240003

Description: Another photo of the laboratory

Location: Onsite laboratory

Facing: Northwest

Date/Time: 02/24/2021 10:56 AM



Photo Number: P2240004

Description: Thermometer inside the refrigerator in the laboratory

Location: Onsite laboratory

Facing: East

Date/Time: 02/24/2021 11:00 AM



Photo Number: P2240005

Description: Samples collected onsite and stored in the refrigerator in the laboratory

Location: Onsite laboratory

Facing: East

Date/Time: 02/24/2021 11:00 AM



Photo Number: P2240006

Description: Control Center

Location: Adjacent to the onsite laboratory

Facing: Southwest

Date/Time: 02/24/2021 11:14 AM



Photo Number: P2240007

Description: Control Center

Location: Adjacent to the onsite laboratory

Facing: Southwest

Date/Time: 02/24/2021 11:14 AM

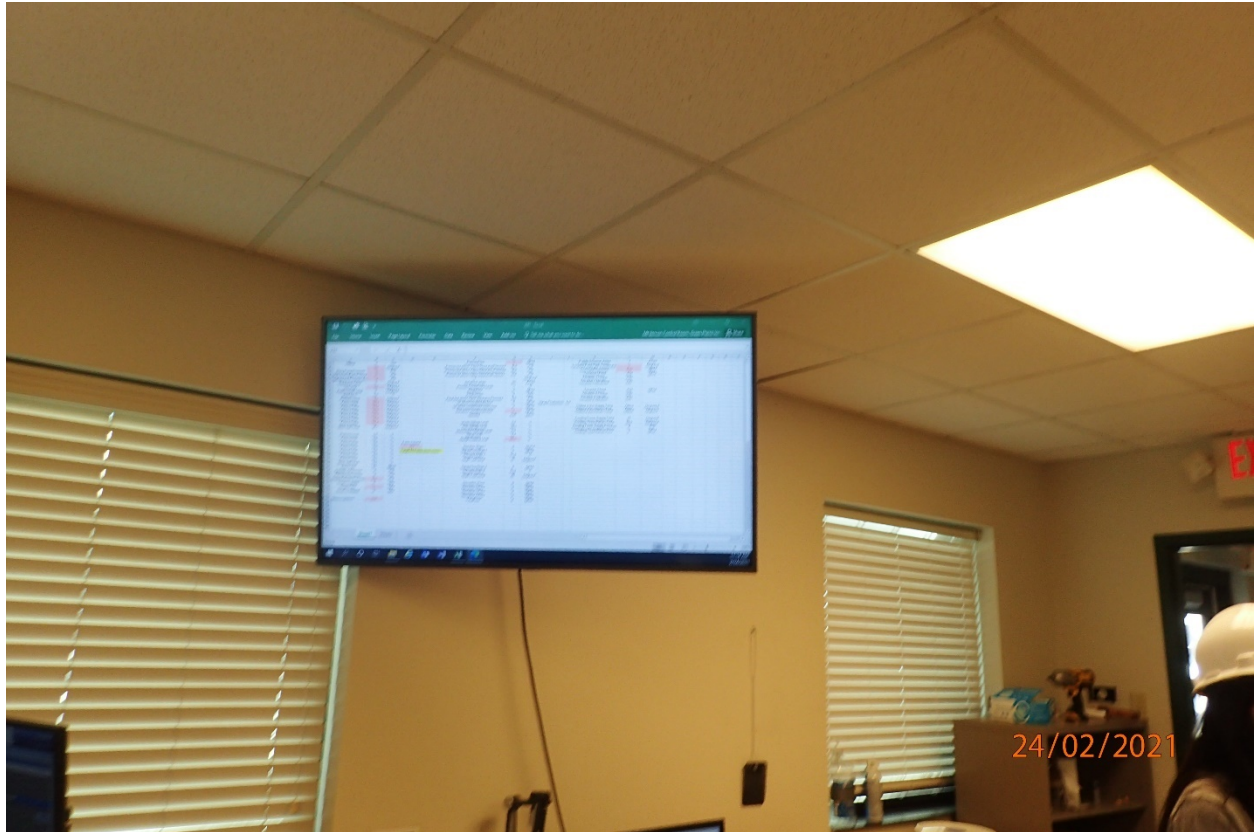


Photo Number: P2240008

Description: KPI Screen within the Control Center

Location: Adjacent to the onsite laboratory

Facing: Northwest

Date/Time: 02/24/2021 11:15 AM



Photo Number: P2240009

Description: Ethanol Storage, Denaturing Tank, and Shifter Tank

Location: Southwest side of the facility - south of the truck loading area
37.908083, -87.7268

Facing: Southwest

Date/Time: 02/24/2021 11:22 AM



Photo Number: P2240010

Description: Ethanol and Corn Oil Truck Loading Area

Location: Southwest side of the facility - South of Corn Bins and Flour Mill
37.908107, -87.726702

Facing: Northeast

Date/Time: 02/24/2021 11:23 AM



Photo Number: P2240011

Description: Spill Containment for the Truck Loading Area for the Corn Oil and Ethanol

Location: Southwest side of the facility - Southwest of the Truck Loading Area

37.90811, -87.726715

Facing: West

Date/Time: 02/24/2021 11:25 AM



Photo Number: P2240012

Description: Drain at the Truck Loading Area for the Corn Oil and Ethanol

Location: Southwest side of the facility - South of the Corn Bins and Flour Mill

Facing: Northeast

Date/Time: 02/24/2021 11:25



Photo Number: P2240013

Description: Grain Receiving Area

Location: West of the Corn Bins and Flour Mill on the west side of the Facility
37.908333, -87.726667

Facing: Northwest

Date/Time: 02/24/2021 11:30 AM



Photo Number: P2240014

Description: Corn Bins and Flour Mill

Location: West side of the Facility

37.90879, -87.727068

Facing: Northeast

Date/Time: 02/24/2021 11:31 AM



Photo Number: P2240015

Description: Rail line loading area for Ethanol and Corn Oil

Location: West of Grain Receiving - west side of the facility
37.908611, -87.72722

Facing: Northwest

Date/Time: 02/24/2021 11:34 AM



Photo Number: P2240016

Description: Corn Oil with 2nd containment.

Location: At the rail line loading area - west of Grain Receiving
37.908795, -87.727462

Facing: West

Date/Time: 02/24/2021 11:36 AM



Photo Number: P2240017

Description: Corn oil storage near the rail lines without secondary containment

Location: At the rail lines loading area for ethanol and corn oil
37.908897, -87.72745

Facing: East

Date/Time: 02/24/2021 11:36 AM



Photo Number: P2240018

Description: Ethanol is filled in the rail cars from the top

Location: West of Grain Mill on the west side of the Facility
37.908611, -87.7275

Facing: Northwest

Date/Time: 02/24/2021 11:41 AM



Photo Number: P2240019

Description: The catch basin on the rail lines to capture any corn oil spillage

Location: West of Grain Mill on the west side of the Facility

37.908897, -87.72745

Facing: South

Date/Time: 02/24/2021 11:41 AM



Photo Number: P2240020

Description: Containment area between the rail track and fence - for corn oil and/or ethanol spill

Location: West of Grain Mill on the west side of the Facility

37.908842, -87.727845

Facing: Northeast

Date/Time: 02/24/2021 11:42 AM



Photo Number: P2240021

Description: Above Ground Chemical Storage Area with concrete secondary containment

Location: In the center of the Facility, south of Cooking Building

37.908905, -87.725743

Facing: Southeast

Date/Time: 02/24/2021 11:52 AM



Photo Number: P2240022

Description: Above Ground Chemical Storage Area with concrete secondary containment

Location: In the center of the Facility, south of Cooking Building

37.908905, -87.725743

Facing: Southeast

Date/Time: 02/24/2021 11:52 AM



Photo Number: P2240023

Description: Blurry picture so another photo is taken P2240024.

Location: Within the Cook Building in the center of the Facility.

37.908905, -87.725743

Facing: Northwest

Date/Time: 02/24/2021 11:55 AM



Photo Number: P2240024

Description: Drains within the Cook Building

Location: Within in the Cook Building in the center of Facility

37.908905, -87.725743

Facing: Northwest

Date/Time: 02/24/2021 11:55 AM



Photo Number: P2240025

Description: Pump area within the Cook Building for the wastewater collected in the drains within the Cook Building

Location: Within the Cook Building in the center of the Facility

37.908611, -87.725556

Facing: West

Date/Time: 02/24/2021 11:59 AM



Photo Number: P2240026

Description: Antibiotics used for fermentation stored in the Cook Building

Location: Within the Cook Building in the center of the Facility

37.908611, -87.725556

Facing: Southwest

Date/Time: 02/24/2021 12:03 PM



Photo Number: P2240027

Description: Sprinklers in the smaller cooling area of the mixing pond

Location: Ponds located on the southeast side of the Facility

37.909115, -87.724365

Facing: Southeast

Date/Time: 02/24/2021 12:07 PM



Photo Number: P2240028

Description: Sprinklers in the larger cooling area of the mixing pond

Location: Ponds located on the southeast side of the Facility

37.908927, -87.724308

Facing: Southeast

Date/Time: 02/24/2021 12:08 PM



Photo Number: P2240029

Description: Stormwater Outfall 001S Gate Valve

Location: Southeast side of the Facility

37.908437, -87.724350

Facing: Northeast

Date/Time: 2/24/2021 12:09 PM



Photo Number: P2240030

Description: Outfall 001s into the unnamed waterway

Location: Southeast side of the Facility

37.908056, -87.723611

Facing: Southeast

Date/Time: 02/24/2021 12:12 PM



Photo Number: P2240031

Description: Another sampling location for outfall 001S

Location: Southeast side of the Facility

37.908263, -87.723805

Facing: Southwest

Date/Time: 02/24/2021 12:13 PM



Photo Number: P2240032

Description: Collection pole for collection of grab samples and T for shutting of the slough gate before Outfall 001

Location: Southeast side of the Facility

37.908313, -87.724010

Facing: Northeast

Date/Time: 02/24/2021 12:17 PM



Photo Number: P2240033

Description: 1 million-gallon Fermentation Tanks (six)

Location: East side of the Facility

37.908413, -87.724192

Facing: North

Date/Time: 02/24/2021 12:18 PM



Photo Number: P2240034

Description: Distillation Area, Beer Well, Evaporation tanks, and the eductor tank

Location: North side of the Facility

37.909665, -87.724383

Facing: Northwest

Date/Time: 02/24/21 12 12:26 PM



Photo Number: P2240035

Description: Stormwater culvert – noticeable oil sheen

Location: East of the Cooling Tower Area

37.909870, -87.724542

Facing: West

Date/Time: 02/24/2021 12:28 PM



Photo Number: P2240036

Description: Cooling Towers

Location: Eastside of the facility – north of the Fermentation Tanks
37.909923, -87.724702

Facing: Southwest

Date/Time: 02/24/2021 12:30 PM



Photo Number: P2240037

Description: On top of the Digester, which was turned off at the time of the inspection

Location: Northeast side of the facility

37.910556, 87.724722

Facing: Southwest

Date/Time: 02/24/2021 12:33 PM



Photo Number: P2240038

Description: Sampling Areas for the Digester Tank

Location: Northeast side of the facility

37.910728, -87.724767

Facing: Southwest

Date/Time: 02/24/2021 12:34 PM



Photo Number: P2240039

Description: Another site for collection of samples in the Digester Tank

Location: Northeast side of the facility

37.910723, -87.724783

Facing: Southwest

Date/Time: 02/24/2021 12:34 PM



Photo Number: P2240040

Description: Sampling location of the Digester Tank.

Location: Northeast side of the facility

37.910770, -87.724748

Facing: Southwest

Date/Time: 02/24/2021 12:35 PM



Photo Number: P2240041

Description: Grab pole to collect samples from the Digester Tank.

Location: Northeast side of the facility

37.910848, -87.724733

Facing: Northwest

Date/Time: 02/24/2021 12:36 PM



Photo Number: P2240042

Description: Sampling collection point at the bottom of the Digester

Location: Northeast side of the Facility

37.910550, -87.724677

Facing: Northeast

Date/Time: 02/24/2021 12:42 PM



Photo Number: P2240043

Description: Equalization Tank 7001 and treated wastewater holding tank 7002

Location: Northeast side of the Facility – immediately west of the digester
37.910853, -87.725272

Facing: Southeast

Date/Time: 02/24/2021 12:45 PM



Photo Number: P2240044

Description: Sluice Gate at Stormwater Outfall 002S

Location: Northwest side of the Facility

37.910742, -87.726813

Facing: North

Date/Time: 02/24/2021 12:47 PM



Photo Number: P2240045

Description: Wet Distillers Grain Storage Area

Location: Northwest side of the facility

37.910742, -87.726813

Facing: Southeast

Date/Time: 02/24/2021 12:49 PM



Photo Number: P2240046
Description: Accidental Photo
Location: Northwest corner of the Facility.
37.91177, -87.726813
Facing: Northeast
Date/Time: 02/24/2021 12:53 PM



Photo Number: P2240047

Description: Evaporator Tanks - southeast of the wet distillers grain storage area

Location: Northcentral area of the Facility

37.911177, -87.726668

Facing: Southeast

Date/Time: 02/24/2021 12:53 PM



Photo Number: P2240048

Description: Sample Collection for Outfall 002S

Location: Northwest corner of the Facility.

37.911272, -87.726682

Facing: Northeast

Date/Time: 02/24/2021 12:55 PM



Photo Number: P2240049

Description: Outfall discharge location for outfall 002S

Location: Northwest corner of the Facility.

37.911315, -87.726667

Facing: East

Date/Time: 02/24/2021 12:57 PM



Photo Number: P2240050

Description: New Evaporators

Location: Northcentral part of the facility

37.910278, -87.725833

Facing: East

Date/Time: 02/24/2021 1:03 PM



Photo Number: P2240051
Description: New Evaporator and Beer Well
Location: Northcentral part of the facility
37.909903, -87.725740
Facing: Northeast
Date/Time: 02/24/2021 1:04 PM



Photo Number: P2240052

Description: Blurry photo retook to look at the water level.

Location: 37.909722, -87.725556

Facing: Southeast

Date/Time: 02/24/2021 1:09 PM



Photo Number: P2240053

Description: RO cooling, Blowdown Cooling

Location: Energy Center – central part of the facility (south of the cook building)

37.909722, -87.725556

Facing: Southeast

Date/Time: 02/24/2021 1:09 PM



Photo Number: P2240054

Description: Level meter that is triggered when the water level reaches a certain height in the tank

Location: Energy Center – central part of the facility (south of the cook building)

37.909722, -87.725556

Facing: Northeast

Date/Time: 02/24/2021 1:10 PM

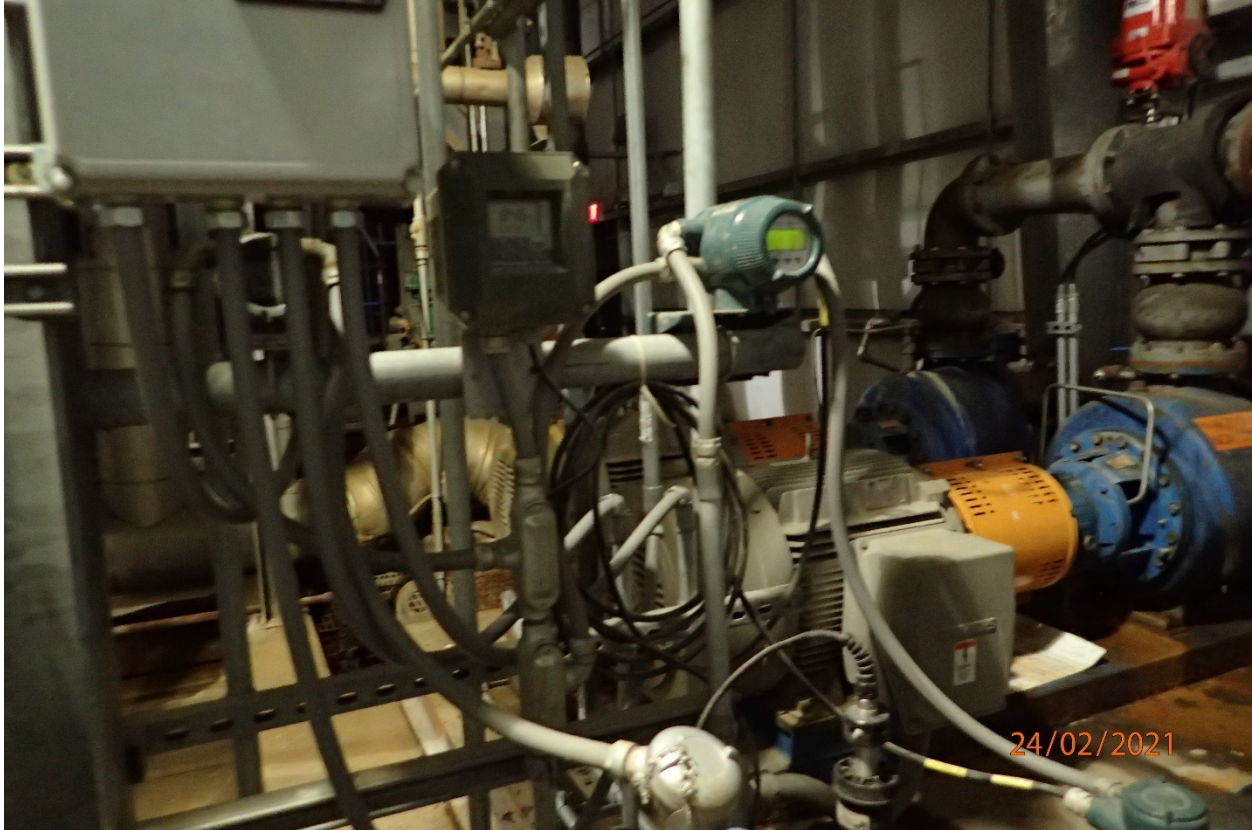


Photo Number: P2240055

Description: Flow meter to measure flow leading to outfall 001S






Location: Energy Center – central part of the facility (south of the cook building)
37.909722, -87.725556

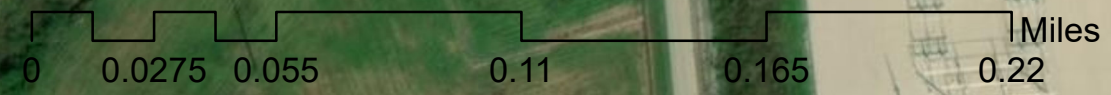
Facing: North

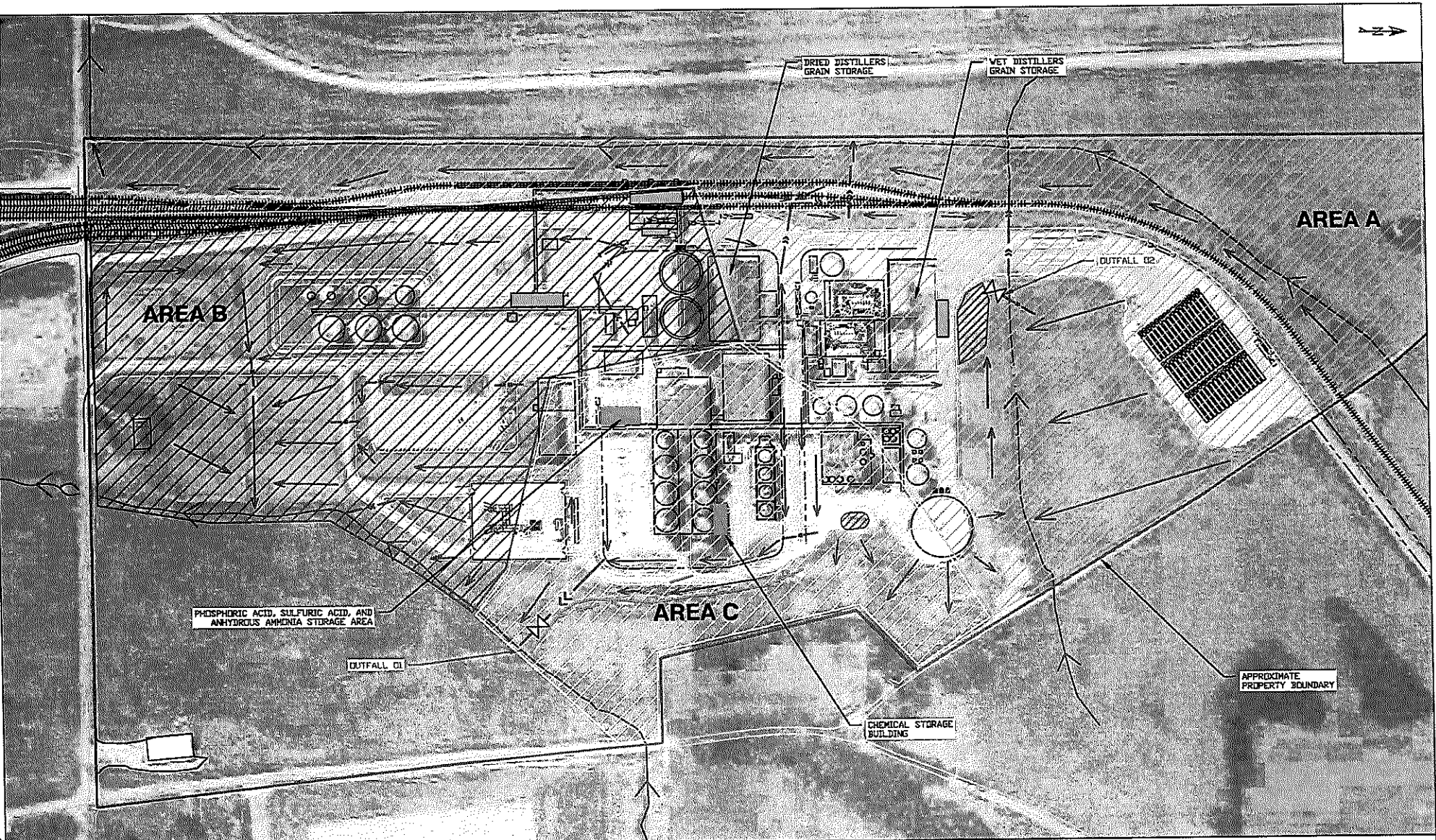
Date/Time: 02/24/2021 1:14 PM

Green Plains Mount Vernon Indiana

Legend

-  c100OLYMP_GeoTaggedPhotosToP1
-  NHDLine
-  NHDFlowline
-  flowlines
-  waterbodies
- World Boundaries and Places
- World Imagery
- Low Resolution 15m Imagery
- High Resolution 60cm Imagery
- High Resolution 30cm Imagery
- Citations

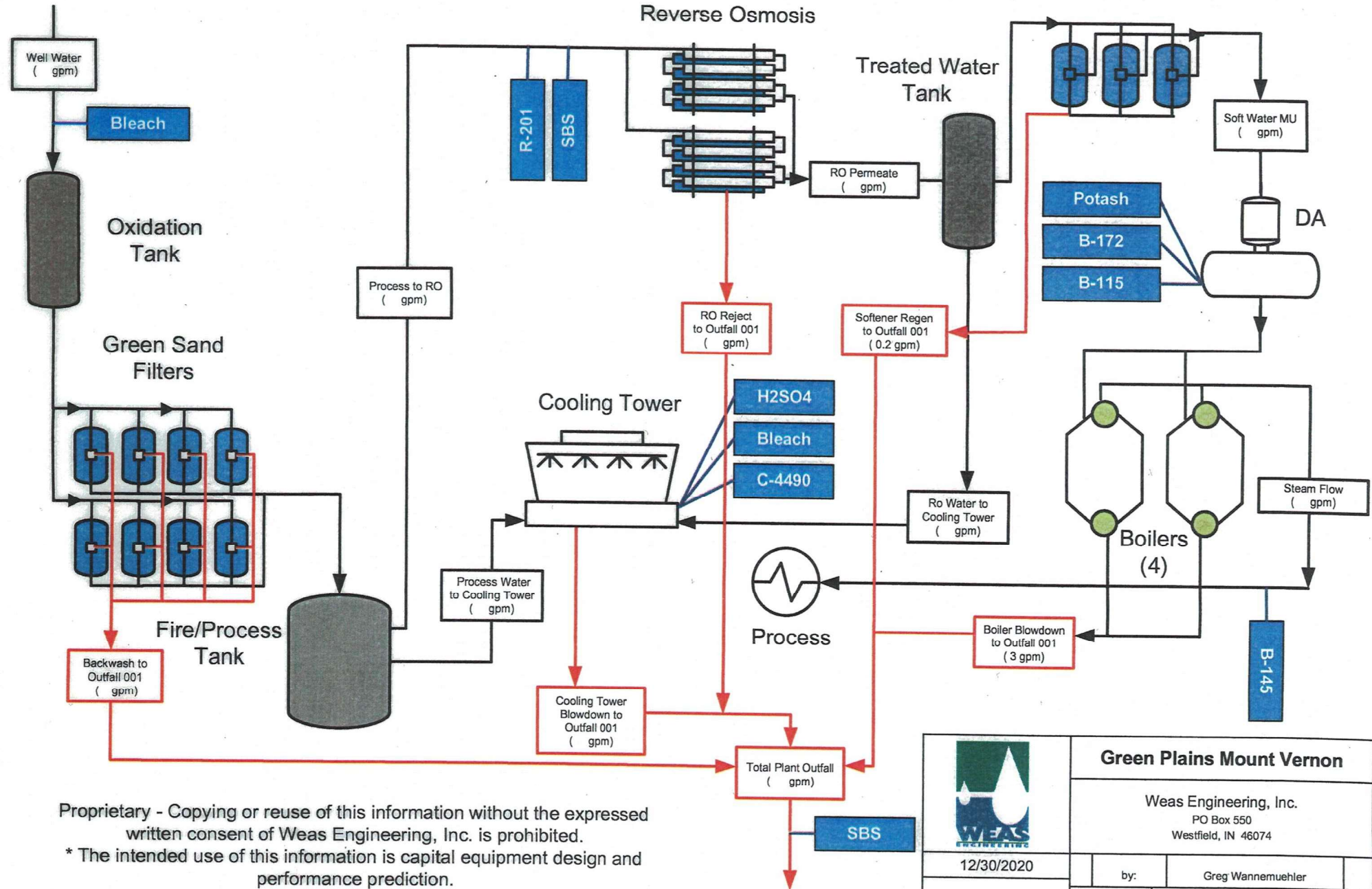





<p>Pinnacle Engineering</p> <p>11541 95th Ave N, Minneapolis, MN 55369 (763) 315-4501 www.plngeng.com</p>	<p>FACILITY DRAINAGE MOUNT VERNON, IN</p>	<p>LEGEND:</p> <p> WET AND DRY DISTILLERS GRAIN LOADOUT</p> <p> STORMWATER FLOW</p> <p> UNDERGROUND STORMWATER CONVEYANCE SYSTEM</p> <p> VALVE</p> <p> STORMWATER POND</p>	<p> FACILITY RUNOFF/SPILL COLLECTION AREA A</p> <p> FACILITY RUNOFF/SPILL COLLECTION AREA B</p> <p> FACILITY RUNOFF/SPILL COLLECTION AREA C</p>	<p> INDUSTRIAL FLOW TO OUTFALL 01</p> <p> ABOVE GROUND DRY DITCH FOR TEMPERATURE CONTROL</p>
	<p> Green Plains</p>			
<p>PROJECT NUMBER:</p>	<p>DRAWN/AR REVIEWED/RA</p>	<p>DATE: 11/9/16</p>		

Green Plains Mt. Vernon Water Mass Balance (Mount Vernon, IN)

Plant Feed



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 * The intended use of this information is capital equipment design and performance prediction.

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12/30/2020	by:	Greg Wannemuehler	
Revision	1	1 OF 1	