

CAA112(r) INSPECTION REPORT

Name: New Heaven Chemicals Iowa LLC	
Address: 1585 380th St Manly, IA - 50456	Date of Inspection: July 27, 2021
County: Worth	Case No: 21IA0721
Phone: 641-454-4030	RMP No: General Duty Clause
High Risk: No	FRS No: 110066863193
CAA Title V: Yes/or synthetics minor	Program Level: General Duty Clause
Mailing Address: 1585 380th St, Manly, IA 50456	
Process: 325180-Other Basic Inorganic Chemical Manufacturing, they make Sodium Methylate from Methanol	

SUMMARY OF OBSERVATIONS

A review of the New Heaven Chemicals Iowa LLC documents and facility revealed the following deficiencies:

- 1. New Heaven Chemicals Iowa LLC failed to identify hazards which may result from releases using appropriate hazard assessment techniques, per CAA Section 112(r)(1).**
- 2. New Heaven Chemicals Iowa LLC failed to design and maintain a safe facility taking such steps as are necessary to prevent releases, per CAA Section 112(r)(1).**

INTRODUCTION

I, Dave Hensley, a Compliance Inspector with the U.S. Environmental Protection Agency (EPA), Region VII, inspected New Heaven Chemicals Iowa LLC located in Manly, Iowa on July 27, 2021.

Lorenzo Sena arranged for the inspection on July 26, 2021, with Paul Katzenberger, Plant Manager. He asked that employees be notified of the inspection and informed they can participate. New Heaven Chemicals Iowa LLC was selected for inspection because a recent Leak Detection and Repair (LDAR) test identified some concerning releases. An initial LDAR inspection and inventory of components regulated under the National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements occurred during the week of June 21, 2021. It showed 34 leaking components. Initial repair was attempted immediately on all leaks. Following

the initial repair attempt, 11 leaking components remained. The remaining leaks have since been addressed, with 10 components repaired within the timeline allowed and one component removed from service.

We conducted the inspection to determine if the facility complies with Section 112(r) of the Clean Air Act (CAA), as amended in 1990. The inspection also included reporting provisions of the Emergency Planning and Community Right to Know Act (EPCRA) and the release reporting provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

EPA has published a document, EPA 550-B00-002, dated May 2000 titled “Guidance for Implementation of General Duty Clause Clean Air Act Section 112(r)(1). This publication is intended solely for the guidance of government personnel but is available to the public at the EPA’s website.

The Clean Air Act Section 112(r)(1), known as the General Duty Clause states: “*The owners and operators of stationary sources producing, processing, handling or storing such substances [i.e., a chemical in 40 CFR part 68 or any other extremely hazardous substance] have a general duty [in the same manner and to the same extent as the general duty clause in the Occupational Safety and Health Act (OSHA)] to identify hazards which may result from (such) releases using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur.*”

HISTORY OF BUSINESS

New Heaven Chemicals Iowa LLC owns and operates a small chemical manufacturing company located near Manly, Iowa that has been in operation since late 2016. The facility can produce 20,000 metric tons per year of sodium methylate solution (SMO Sodium Methylate is used as a catalyst in biodiesel production (<https://newheavenchemicals.com/>). Methanol and sodium hydroxide are the raw materials used in the production of sodium methylate.

Methanol is a colorless volatile liquid with a faintly sweet pungent odor like that of ethyl alcohol. Methanol completely mixes with water. The vapors are slightly heavier than air and may travel some distance to a source of ignition and flash back. Any accumulation of vapors in confined spaces, such as buildings or sewers, may explode if ignited. It is used to make chemicals, to remove water from automotive and aviation fuels, as a solvent for paints and plastics, and as an ingredient in a wide variety of products. Exposure to excessive vapor causes eye irritation, headache, fatigue, and drowsiness. High concentrations can produce central nervous system depression and optic nerve damage. 50,000 ppm will probably cause death in one to two hours. Methanol can be absorbed through skin. Swallowing may cause death or eye damage. The immediate dangerous to life or health is 6,000 ppm. Methanol is a highly flammable substance that can be ignited under almost all ambient temperature conditions, with a flash point of 52°F. Methanol’s lower explosive limit (LEL) is 6% and upper explosive limit (UEL) is 36.5% (CAMEO Chemicals).

Sodium methyllate solution (SMO) is colorless cloudy white liquid consisting of sodium methyllate, a solid, dissolved in methyl alcohol. It is corrosive to metals and tissue. Used to process edible fats and oils and as a catalyst in chemical manufacture. It is highly flammable, ignites in moist air, and reacts with water to produce a mixed solution of sodium hydroxide and methyl alcohol. It can be ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) causing vapor explosion hazard indoors, outdoors, or in sewers. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated. SMO is a strong base. It reacts with light metals forming hydrogen gas with fire and explosion hazards (CAMEO Chemicals). New Heaven Chemicals Iowa LLC's SMO LEL is 6%, UEL is 50%, and its flash point is 92.3-96°F (New Heaven Chemicals Iowa LLC's safety data sheet).

Given the toxicity and flammability characteristics of both methanol and sodium methyllate solution (SMO), they are considered extremely hazardous substances and are regulated under the CAA 112(r)(1) General Duty Clause. These chemicals are not listed in 40 C.F.R. Part 68 and, therefore, the requirements listed in the CAA 112(r)(7) do not apply.

New Heaven Chemicals Iowa LLC's maximum storage quantity inventory of methanol is 250 kiloliters, 66,043 gallons, or about 435,004 pounds. New Heaven Chemicals Iowa LLC's maximum storage quantity inventory of SMO is 350 kiloliters, 92,460 gallons, or about 748,468 pounds.

The facility was shut down during the inspection and methanol and SMO storage was minimal.

PERSONS INTERVIEWED AND INDIVIDUAL RESPONSIBILITIES

Name	Responsibilities
Paul Katzenberger	Plant Manager
Torie Foster	Maintenance Supervisor
Marc McClure	Assistant Plant Manager

OPENING CONFERENCE

Lorenzo Sena and I (Dave Hensley) arrived at New Heaven Chemicals Iowa LLC's office at 1585 380th St, Manly, Iowa just before 8:00 AM. We were met by Paul Katzenberger who showed us to a conference room where we met Marc McClure and Torie Foster. We were met there by Tyler Salamasick and Luke Rodriguez, EPA CAA compliance inspectors, conducting a stationary source inspection. We were also met by David Miller, Senior Environmental Specialist with Iowa Department of Natural Resources, and Jesse Tidrick of Apollo Water Service. We each introduced ourselves and then proceeded with an opening conference. Tyler Salamasick gave a description of the CAA inspection he was leading. Lorenzo Sena gave a general description of the Clean Water Act NPDES and the water inspection he was conducting. I discussed the CAA 112(r)/EPCRA non-313 inspection and requirements in general. I provided a notice of inspection form that Paul Katzenberger and I signed (Attachment #1). We discussed confidential business information (CBI). New Heaven Chemical Iowa LLC did not claim

confidentiality for the documents I collected. They did, however, claim some process information and documents which Tyler Salamasick collected. Discussion of this process information relevant to this inspection is in Attachment #2 that is protected per applicable rules and regulations.

FIELD TOUR

At 9:15 AM we started a field tour of New Heaven Chemicals Iowa LLC. Paul Katzenberger conducted us and Marc McClure, Torie Foster, Jesse Tidrick, and David Miller accompanied us. Luke Rodriguez, Tyler Salamasick, Lorenzo Sena, and I (Dave Hensley) were present from EPA. Tyler Salamasick ran a FLIR camera observing for releases and Luke Rodriguez operated a Toxic Vapor Analyzer (TVA), of which neither detected releases. The facility was not producing sodium methylate at the time of the inspection. The facility was not in operation at the time. I took 30 photos which are documented in Attachment #3. We started at the methanol bulk storage tanks. The three methanol bulk storage tanks appeared in good condition, Photographs 1, 2, and 3. They were equipped with combination pressure relief/vapor relief valves that would relieve excess pressure and vacuum. The methanol tanks were in the same containment structure as the SMO tanks, Photographs 2 and 3. These tanks were insulated. A fire extinguisher, safety shower, and eyewash station were present in this area, Photographs 3, 4, 5, 29, and 30.

From the bulk storage tanks, methanol is piped to the SMO Production Area. Here it is mixed and reacted to form SMO. Paul Katzenberger walked us through the process. Detail process descriptions were claimed CBI and are discussed in Attachment #2. I asked if personnel operating the process wore proper personal protective equipment (PPE). Paul Katzenberger said they did and used respirators and wore chemical protective suits. Fire extinguishers are placed in the SMO Production area (Photograph 10). I observed intrinsically safe lighting and shut off switches installed in the process area. I noticed cardboard on a condenser vessel, Photograph 9. I asked Paul Katzenberger about it and he stated it was there because they had been doing some clean up while offline and it would not be there if the process was operating. Two blowers had been removed from the process tanking condensate columns that were out of service. Paul Katzenberger said they had to be repaired or replaced. Replacement looked to be the better choice and was in progress. Paul Katzenberger said that they had to repair a condenser located above the second story walkway. While doing so they realized that the tubes in the condenser were malleable iron, not stainless steel. The use of malleable iron as opposed to stainless steel impacted the iron concentration in their non-process wastewater (see associated water inspection). Paul Katzenberger went on to explain to Lorenzo Sena that the entire plant was built in India and shipped as modules. He also explained that they are discovering issues with materials and construction and at times have problems locating parts for some of the equipment.

LDAR tags were present on many process components. Yellow tags indicated where leaks had been identified and repaired. White tags indicated where tests were done. One pump was not repaired but removed from service. Second line end valves had been installed on some sampling points, like the one in Photograph 11. LDAR tag 197-002 was on a moisture trap in Photographs 12, 13, and 14. The was one of the highest readings, at 29,856 PPM, in the LDAR testing, and was repaired by closing a valve. This moisture trap appears more corroded than one would expect from exposure to the elements since 2016. Another moisture trap showed some corrosion,

Photograph 20. SMO is piped to the storage tanks after it passes quality control. Unreacted methanol is recycled back through the process. SMO which does not meet the desired specification of less than 15% water is pumped back to the mixing tanks and is reprocessed in the separatory columns and condensers. SMO is loaded into tanker trucks for delivery to customers.

We continued the field tour in the Boiler House where Paul Katzenberger, Luke Rodriguez, and Tyler Salamasick discussed operation of the boiler. I noticed an arc welder and oxyacetylene torch in the boiler house, Photographs 15 and 16. I asked Paul Katzenberger how they used them. He stated that he was the only certified welder on site and they used proper safety procedures, including monitoring for flammable gasses and PPE, when welding was done. The boilers are inspected by the State of Iowa Division of Labor Services, Photograph 17.

Outside of the Boiler House was a white poly tote as shown in Photograph 19. David Miller asked what it was and Paul Katzenberger said it was a used oil container. Mr. Miller said it should be labeled as such per the Resource Conservation and Recovery Act.

The tour continued toward the generator, passing the south end of the SMO Process. The wastewater frac tanks are shown in Photograph 21. The grounding field and electrical connections to the process are shown in Photograph 22. Paul Katzenberger stated that lightning had struck the grounding field a few months back. No visible sign of the lightning strike was present. Paul Katzenberger, Luke Rodriguez, and Tyler Salamasick looked at and discussed the generator. Luke Rodriguez noticed a couple of pipe sections missing on the south end of the SMO Process, Photographs 23 and 24. Luke asked Paul Katzenber why they were missing. Paul said they were steam pipe that had been taken out during the shutdown to be repaired.

Luke Rodriguez asked to see the methanol unloading station. On the way I noticed a sulfuric acid tank associated with the wastewater system. It is shown as Photograph 25. Paul Katzenberger took us on to the unloading area. Methanol is unloaded from railcar to New Heaven Chemicals Iowa LLC's bulk storage tanks via a hose connection to hard piping system. I observed that grounding and bonding equipment was present in the area, Photographs 26, 27, and 28, as well as a fire extinguisher, Photograph 29. After this we went to the truck loading area where SMO is loaded into trucks. An eye wash station (Photograph 30) and safety shower are stationed there. This concluded the field tour.

HAZARD IDENTIFICATION

I asked if New Heaven Chemicals Iowa LLC had performed a hazard assessment, hazard review, or process hazard analysis. Paul Katzenberger said they did not. They did have some hazard identification in the safety data sheets (SDS) for all the chemicals onsite, safe work practices, and procedures. Samples of SDS are in Attachment #4. New Heaven Chemicals Iowa LLC had also started a Safety Manual that had a Hazard Management section that only had a note that read "Need hazard risk JSA process". Marc McClure stated that they had started this process but had not finished.

NFPA 30 Flammable and Combustible Liquids Code section 6.4.1 states “*operations involving ignitable (flammable or combustible) liquids shall be reviews to ensure that fire and explosion hazards are addressed by fire prevention, fire control, and emergency action plans, except as provided in 6.4.1.1*”

- 1. New Heaven Chemicals Iowa LLC failed to identify hazards which may result from releases using appropriate hazard assessment techniques.**

FACILITY DESIGN AND MAINTENANCE

Design

New Heaven Chemicals Iowa LLC was constructed in 2015 to 2016. Paul Katzenberger was involved as a contracting engineer. The facility was designed by New Heaven Chemicals Inc. It is the company's first location in the United States.

Paul Katzenberger indicated they have had some issues with pump and blower failures. The pump seals are hard to get due to the only source of manufacture being in India and increasingly so in this time of global pandemic. New Heaven Chemicals Iowa LLC has started the process of switching to more reliable pumps that will be easier to get parts for.

New Heaven Chemicals Iowa LLC’s sodium methylate solution (SMO) 30% SDS list aluminum, lead, brass, zinc, and tin as incompatible materials. SMO is corrosive to these metals. New Heaven Chemicals Iowa LLC insulated its SMO piping with aluminum insulation. Some insulation appears to have begun to corrode where it could have been exposed to SMO, as seen in Photographs 23 and 24 below.

On the field tour I observed that moisture traps were showing signs of corrosion, Photographs 12, 13, and 14. The data plants on these showed they were constructed of SA 516 Gr. 70 steel.

Intrinsically safe lights were installed in areas where flammable vapors might be present. Fire extinguishers and safety shower and eye wash stations were strategically placed in the process areas. This can be seen in Photographs 3, 4, 5, 10, 29 and 30.

One condenser [C303A] was installed with malleable iron tubes instead of stainless steel. Because of this, iron was being leached from the tubes and into the non-process water during operation which led to nearly continuous non-process effluent violations. This led to elevated iron levels in Hew Heaven Chemicals Iowa LLC’s wastewater (see associated NPDES inspection). Upon discovering this, the facility raised the pH of the non-process water to reduce leaching of iron from the condenser.

Maintenance

I asked for maintenance procedures. New Heaven Chemicals Iowa LLC did not have formal written maintenance procedures. Paul Katzenberger and Torie Foster said they “run to failure”. Torie Foster is responsible for all maintenance at the facility. During the field tour, I observed two blowers and thus condensate columns, and a pump that were currently removed from service. The pump had been removed from service due to the June 2021 LDAR study.

The June 21, 2021, LDAR study showed 34 leaking components. Initial repair was attempted immediately on all leaks. Following the initial repair attempt, 11 leaking components remained. The 11 remaining leaks have since been addressed, with 10 components repaired within the timeline allowed and one component removed from service. These repairs included replacing gaskets, tightening bolts, closing valves, tightening valve packing, connector tightening, replacing a plug seal, and reseating a pressure relief valve.

NFPA 30, section 21.8 Inspection and Maintenance of Storage Tanks and Storage Tank Appurtenances, requires that each tank constructed of steel be inspected and maintained per API [American Petroleum Institute] Standard 653 Tank Inspections, Repairs, Alterations, and Reconstructions, or STI [Steel Tank Institute] SP001, Standard for the Inspection of Aboveground Storage Tanks. Both standards require formal reoccurring in service inspections, external inspections, and internal inspections.

2. New Heaven Chemicals Iowa LLC failed to design and maintain a safe facility taking such steps as are necessary to prevent releases, per CAA Section 112(r)(1).

Operations

New Heaven Chemicals LLC had developed standard operating procedures. While simple, they were accurate to how Paul Katzenberger described the process during the inspection. I collected an example operating procedure (Attachment #5).

Training

I asked if New Heaven Chemical LLC trains employees on the hazards associated with the chemicals they handle. Paul Katzenberger provided an employee handbook and documentation of operator training.

Managing Change

New Heaven Chemical LLC does not have a management of change program.

PLANNING

I asked if they had coordinated emergency response. Paul Katzenberger said the Manly Iowa Fire Department has been onsite. I asked if they had attended a local emergency planning committee meeting. He indicated that they had not. New Heaven Chemical LLC has submitted EPCRA Tier II Chemical Inventories for calendar years 2017, 2018, and 2019.

CLOSING CONFERENCE

At 2:00 pm we gathered in the conference room for a closing conference. Paul Katzenberger, Torie Foster, and Marc McClure of New Heaven Chemical LLC were present. Luke Rodriguez, Tyler Salamasick, Lorenzo Sena, and myself (Dave Hensley) were present from EPA. I told them I did not have any preliminary findings at the moment. I told New Heaven Chemical LLC that I was concerned with their lack of a complete hazard assessment, and their lack of a formal mechanical integrity program. Marc McClure stated that they would complete the hazard assessment. I also told them I would be reviewing the documents collected with a focus on the design of the facility.

Tyler Salamasick covered observation from the CAA inspection and Lorenzo Sena covered observations from the CWA NPDES inspection.

Dave Hensley
Compliance Inspector

Tracey Casburn
Air Branch Chief

ATTACHMENTS

1. Inspection Forms
2. CBI Discussion
3. Photo Log
4. Safety Data Sheet
5. Procedure