

Attachment 9

Baird, Mandalas, Brockstedt
1413 Savannah Road, Suite 1
Lewes, Delaware 19958

March 2, 2022

Attn: Mr. Chase Brockstedt

Re: Proposed EPA Consent Decree with New-Indy Catawba Mill, Lodged 12/29/21, Civ. No. 21-cv-02053-SAL

Dear Mr. Brockstedt,

This letter is a summary of my opinions and comments concerning the above-referenced Consent Decree (CD) proposed by the EPA to prevent future noxious and toxic odor emissions from the New-Indy Catawba Mill. I have reviewed multiple documents describing the situation that has been occurring at the Catawba mill, including among other documents, the 6/15/2021 Corrective Action Plan (CAP), the CD, and comments September 24, 2021 Ken Norcross. I support the comments provided by Mr. Norcross regarding the need for New Indy to upgrade and expand their Catawba Mill wastewater treatment (WWTP) facilities. In this letter I will focus on issues that are derived from my particular expertise and experience. My opinions are based on over 40 years of experience in engineering, operations, and management in the Kraft pulping industry with similar processes to the New Indy Mill at other facilities.

Qualifications

- BS in Chemical Engineering in 1981 from NC State University
- Professional Engineer (registered in NC) for approximately 20 years (currently in Retired Status)
- Worked for 4 different pulp and paper companies in many different Kraft pulp mills (both bleached and unbleached pulp)
- Engineering, Technical, Operational, Supervisory, and Management rolls as employees of Paper Companies for 20 years
- Participated in Corporate Audit programs for 2 of these companies reviewing operations at all of their Kraft pulp mills.
- Worked as Consultant and Temporary Support for several other mills for another 20 years
- Have visited or audited over 30 Kraft pulp mills all over the US and Canada

General Comments about the odor problem

The Catawba Mill's operations have obviously not been adequately controlling emissions to the environment, as is evidenced by the multitude of odor and health-related complaints being lodged by members of the community. Community complaints can provide important clues as to the source of the odor problem(s), but given the complexity of chemicals and emissions from Kraft pulp mills, the public is usually not able to discriminate and describe odors well enough to pinpoint the particular source or cause at the Mill. For instance, if a complaint is described as "rotten egg odor," all sources of odor should be investigated, not just hydrogen sulfide (H₂S). There are many different odor sources in a Kraft pulp mill, not just H₂S. From my experience, the noxious "sweet" smell and the "solvent" smell being reported are both most likely from foul condensate. From what I have seen, The CD and much of the odor control effort focuses only on H₂S, ignoring other likely sources of odor complaints.

From my experience dealing with community complaints, the community usually responds more to acute changes in odor, not chronic, low intensity odors. Adequate monitoring of fence-line H₂S levels might help detect longer-term odors from an improperly designed or operated WWTP, but odor and health-related complaints also are likely to occur as the result of upsets in operation such as venting collected gas streams or the discharge of inadequately treated foul condensate. From my experience, sources of acute odor at pulp mills include non-condensable gas (NCG) collection systems, vented foul condensate and stripper off gases (SOGs) which are not addressed at all in the CD or the CAP.

Specific Issues with the proposed CD

1. **Vent times for NCGs and SOGs should be logged and reported, with established permit levels and penalties for exceeding these limits.** The proposed CD contains nothing to deal with venting of NCGs or SOGs. The New Indy Mill should routinely determine the cause of any currently operating vents and make operational or equipment modifications to eliminate venting. In my experience, the majority of the vent time in most mills is due to incineration point upsets. All NCGs should have an on-line alternate incineration point, so that if there is a process upset, the gases can immediately be sent to the alternate incineration point. Some mills even have designed and installed “ventless transfer systems” so that the gases automatically transfer to the alternate incineration point, with no venting.

2. **Foul Condensate should never be purposely sent to the WWTP.** There are several problems with the proposed CD relative to foul condensate treatment.
 - a. **Treating foul condensate with an oxidizer (such as hydrogen peroxide) will not eliminate the persistent odors.** H₂S and many other Totally Reduced Sulfur (TRS) compounds can be eliminated by chemical oxidation, but foul condensate contains many other odorous, noxious, and toxic compounds in addition to H₂S and TRS. Foul condensate and NCG gases can contain methyl mercaptan, dimethyl disulfide, dimethyl disulfide, acetaldehyde, acetone, methanol, terpenes, methyl ethyl ketone, and other unknown chemicals from pulping reactions. As seen in Table 1 below, significant concentrations of odor causing chemicals are commonly found in foul condensate, several of which would not be eliminated by addition of hydrogen peroxide or oxidant. Oxidation with hydrogen peroxide will reduce the odor from the H₂S and TRS, but odors from many of the other compounds would still persist. Alcohols such as ethanol and methanol could oxidize into aldehydes and carboxylic acids. Ethanol and methanol have familiar “alcohol” smells, whereas aldehydes are known for their sweet and pungent odors. Terpenes have a sweet piney “turpentine” odor, but when oxidized can form formaldehyde, which has a distinctive “chemical” smell. A mixture of these chemicals could easily be the source of the “noxious sweet chemical” smell being reported.

Table 1. List of compounds found in kraft condensates, and their maximum reported concentrations (adapted from Blackwell et al.,1979)

Compounds	Concentration (mg/L)
TRS: H ₂ S	660
CH ₃ SH	5,300
DMS	7,400
DMDS	4,100
BOD: methanol	12,000
ethanol	3,200
acetone	500
methyl ethyl ketone	27
terpenes	25,000
phenolics	82
Resin acids	230
Total BOD ₅	13,000
Sodium	370
Suspended solids	70
pH	6 – 11.1

The CD does not require all of the foul condensate to be stripped. Most of the odorous compounds in foul condensate are volatile and will be liberated into the air (especially at the aerators) before being consumed by bacteria in the Aeration Stabilization Basin (ASB). The CD should require the installation of sufficient steam stripper capacity to treat all foul condensate properly, including backup capacity for stripper outages or repairs which are unavoidable.

- b. The mill should not be allowed to operate by sending foul condensate to the WWTP.** The CD at Appendix A allows New Indy to shut down the steam stripper for “scheduled and unscheduled downtime” amounting to 24 days annually the first year and 19 days per year thereafter. Routine steam stripper maintenance should be performed during pulp mill maintenance outages, eliminating the need for running the mill without the stripper. The proposed CD allows extremely long time periods of pulp production without the stripper being in operation. Foul condensate can be stored in a storage tank or returned to the weak black liquor tank during short stripper outages. If the mill wants to reduce the likelihood of shutdowns due to stripper outages, then they should install backup capacity. I have worked at mills that would shut the pulp mill down if they could not store or treat all of the foul condensate properly.
 - c. Foul condensate causes other problems with the WWTP.** From my experience, the compounds in foul condensate not only contain a very high Biochemical Oxygen Demand (BOD) load, but they affect the bacteria (commonly called “bugs”) in the WWTP in such a way that they reduce the treatment efficiency of the WWTP. The commonly used phrase to describe this activity is that foul condensate is like “crack” to the “bugs”. The bugs start to eat the crack, and they don’t eat the other BOD as well. I believe the observation is actually due to toxic compounds in the foul condensate affecting the bacteria.
 - d. Dumping foul condensate should be logged and reported.** Dumping foul condensate into the WWTP is a significant odor problem and the causes of the dumping should be determined, prioritized, and eliminated with improvements in operation and/or equipment.
- 3. Remove the solids from the ASB and return the WWTP to original condition.** The proposed CD allows the mill to operate while only removing a minimal amount of the solids from the Aerobic Stabilization Basin (ASB). A well-run WWTP will produce only a minor amount of odor, as long as the Dissolved Oxygen (DO) levels in the ASB are well controlled, and the amount of solids in the ASB is maintained at a minimum level to prevent the amount of H₂S gas produced from exceeding the amount that is soluble in the water flow. In normal operation, the BOD in the wastewater is consumed by bacteria and converted to a bacteria mat or sludge on the bottom of the ASB(s) and holding pond(s). This bacteria mat usually then slowly degrades in anaerobic condition, generating H₂S, but H₂S is soluble in water so if operated properly, most of this H₂S is oxidized and H₂S liberation to the atmosphere is minimal. If the bed in the ASB(s) or holding pond gets too thick, then the H₂S generated will exceed the solubility of the water, and will cause significant odor problems. From the information I have reviewed, the solids accumulation at the Catawba Mill remains significantly in excess of what would allow proper operation.
- 4. Require proper control of foam and floating solids on the ASB.** The proposed CD allows the Catawba Mill to leave the accumulated floating solids deposits that are obstructing proper aeration and flow pattern in the ASB. Again, the WWTP should be required to original to its original design condition. Past overload of the WWTP with foam producing chemicals (likely black liquor) and solids, (likely containing a lot of pulp fiber) has drastically deteriorated the condition of the WWTP. Past abuse of the WWTP should be remediated.
- 5. Require increased testing and reporting of Dissolved Oxygen (DO) and suspended solids.** Past negligence in WWTP operation should not be allowed to reoccur. Adequate DO testing and periodic profiling should be required in order to assure proper operation of the aerators, and to assure minimal river water DO depression after the outfall. In my review of available DO data, control in the outfall was not totally in specifications, and yet, in the last permit renewal, the mill requested reducing or eliminating DO reporting. Since the mill has failed in the past to properly operate the WWTP, resulting in unacceptable

liberation of odor to the environment and community, I believe it is the responsibility of the regulatory agencies to require adequate proof of proper operation.

6. **Require the installation of an activated sludge system with secondary clarifiers.** The Catawba Mill has not demonstrated the ability to operate the current treatment system without carryover of excessive amounts of solids, which have accumulated in the ASB and holding ponds to the point where they are causing excessive odor. A properly designed and operated activated sludge system would improve BOD removal and practically eliminate the accumulation of sludge in the holding ponds.

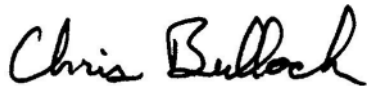
Other Considerations

From my experience, there are other considerations associated with foul condensate segregation and stripping that may help the mill reduce their odor generation problems. I do not have enough information to determine whether or not these issues are a problem at this mill but the proposed CD should require New-Indy to evaluate, report back and take necessary corrective action on these issues.

- I gather from my document review that there are issues with the Trim Condenser on the stripper. Normally proper operation of a foul condensate stripper with the trim condenser out of service is very difficult. This may be a cause of excessive SOG venting, and associated odor problems.
- Some stripper designs do not inherently handle the volatile compounds in foul condensate in a stable manner. Some systems remove the moderately volatile compounds (such as methanol) separately as a liquid, rather than with the highly volatile compounds that readily vaporize into the SOGs. This can provide much improved incineration control, and fuel utilization. This can dramatically reduce venting due to incineration problems.
- In some mills, poor segregation of the foul condensate in the evaporators can cause the generation of excessive volumes of foul condensate. Improving segregation may be a way of addressing the lack of stripping capacity.
- Small leaks can cause significant odor problems when dealing with foul condensate, NCGs, or SOGs. A leak survey should be required to be performed periodically as routine maintenance with logs and reports submitted to EPA and the state agency.

In my opinion, most people don't realize the dramatic difference between different types of pulp and paper mills. When it comes to managing Kraft pulp mills, like Catawba, environmental concerns and community relations are extremely important. Management must prioritize environmental protection and community safety as high as any other corporate priority. Based on my experience managing pulp mills, when it comes to environmental control, if you instruct operations to "run it right, or shut it down," then they will learn how to "run it right." If you let them run it wrong, then they will run it wrong.

Please let me know if you have any questions.



Chris Bullock
Heritage Industries