

Civil Action No. 2:17-CV-47

San Antonio Bay Estuarine Waterkeeper et al

vs

Formosa Plastics Inc, et al,

In the United States District Court
for the Southern District of Texas, Victoria Division

**Supplemental Expert Witness Report
CONFIDENTIAL (Based on Information Labeled
Confidential by Formosa)**

Prepared for:

TEXAS RIOGRANDE LEGAL AID, INC

Prepared By:

Aiza F. Jose-Sanchez, PhD, PE

October 10, 2018

CONFIDENTIAL (Based on Information Labeled Confidential by Formosa)
Supplemental Opinion of Aiza Jose-Sanchez, PhD, PE
October 10, 2018

In my Expert Report from July 9, 2018, I proposed a pond system as a preliminary conceptual design for Formosa's stormwater management and estimated the cost for two different alternatives as \$1,678,823 and \$2,648,723 (Expert Report at 47-48). I noted several assumptions and limitations in the information available to me when I designed this system, including but not limited to:

- 1) The proposed system "does not address flood control requirements ... to address the 100-year or even the 500-year storm events. Instead, the proposed system addresses the first flush caused by stormwater runoff" (Expert Report at 43). In addition, my proposal was designed based on only rainfall, not additional washwater, being conveyed into the stormwater system.
- 2) I did not and still do not have comprehensive hydraulic studies or information about the capacity of the stormwater conveyance system at Formosa. (Expert Report at 20-21)
- 3) The proposed system "assumes proper source controls ... [and] it is assumed that those improvements ... are not included as part of the stormwater management system or in the preliminary cost calculations." (Expert Report at 43).

Since submitting my report, I have reviewed additional information provided by Formosa about bids and plans for a South Pond for the stormwater from outfalls 006, 007, 008, 009, and 012, bids for a Pellet Recovery Project at the HDPE I unit, and a preliminary plan for a pellet removal system at LLDPE (FCP031688-FCP031746, FCP033313-033329). These bids and plans appear to be premised on more information than was available to me. Specifically, it appears that capacity issues may exist in the stormwater conveyance system, such that Formosa is asking for a redesign of a system that manages both a 100-year and 500-year rainfall event. The hydraulic capacity of the conveyance system is critical for the proper control of pellets and powders in the stormwater flows (Expert Report at 21). If capacity is compromised, pellets and powders will be discharged beyond the ditch channel banks and/or would likely bypass any existing screens and booms targeting the control of those floatables. The first-flush pond for a 2-year rain event proposed in my testimony could not contain those rainfalls (Expert Report at 43), and assumes that wash water flows conducted at the facility are negligible compared to the 2-year storm event. Given the information I have now reviewed, I believe the bid with the larger pond, being considered by Formosa, appears to be based on additional information than I could review. Since hydraulic information related to facility wash water flows and any additional hydraulic studies have not been available for my review, the adequate sizing of the conveyance system and the sizing of pond to treat the 2-year storm event plus wash water flowing into

the system has an associated degree of uncertainty. Therefore, the cost of the system proposed in my expert report may need to be supplemented with additional costs to consider additional washdown flows, if significant relative to the 2-year storm event.

The information provided for the proposed South Pond includes installation of mechanical screens including three pellet strainer/screening systems in series and potentially an additional telescopic hydraulic screening system. From vendor information, the general sizing of the screens on the pellet strainers varies but appears to be as small as 0.12 in (3 mm). No screen size specifications were provided in the South Pond plans. No screen size was specified for the telescopic hydraulic system. Assuming the smaller size screen is used for the pellet strainers, a pellet removal of less than 97.8% would be expected (mesh analysis for pellets was only provided for mesh sizes 4mm and 2.366 mm, with 4 mm removing only 10% of the pellets, but the 2.366 mm removing 97.8% of the pellets. Exact percentage removal cannot be interpolated due to the significant variability between the two data points). The mechanical screens would not be small enough to remove powders.

With the information available and without testing/performance data, it not possible to compare differences in performance between the system proposed in my Expert Report and this system based solely on pellet removal. However, the system proposed in my Expert Report is more efficient overall as it would also address powder removal.

If a Zero Discharge South Pond is the preferred pellet control mechanism selected by Formosa, as described in the scope of work for the South Pond, and given that flow calculations are adequate to size the pond, the bid for the Zero-Discharge South Pond could be considered as an alternative solution from the one provided in my Expert Report for pellet and powder control for Outfalls 006, 007, 008, 009, and 012. A zero-discharge solution would mean no stormwater flow discharges (thus, no discharge of pellets or powder associated with those flows) to the environment, making it a more effective than any other removal and control mechanism proposed, including the one that I proposed in my Expert Report.

I must point out, however, that the proposed bid for the South Pond does not address stormwater from other outfalls that also have been provided with pellets and powder stormwater controls: outfalls 002 003, 004, and 005. So, the bid, while comprehensive related to larger storm events and efficient if zero discharge is achieved, will not manage the water in all stormwater outfalls that may discharge pellets and powder. This means that potentially an even bigger or additional pond should be designed to capture water from outfalls 002, 003, 004 and 005. A very rough approximation of the additional capacity could be made by incorporating the additional surface drainage area for outfalls 002, 003, 004, and 005. Combined surface area of outfalls 002, 003, 004 and 005 (approximately

207.6 acres) compares to combined surface area for outfalls 006, 007, 008, 009 and 012 (approximately 1,092.9 acres). This roughly translates in an additional 19% pond capacity required to accommodate flows from those other areas.

Additionally, a bid for improvements at Formosa's HDPE1 unit has been provided to me. I did not develop any costs for source control proposals in my expert opinion, but believe the bid developed with and for Formosa would be reasonable to consider as appropriate to limit the opportunity for pellets and plastics to be discharged. A conceptual plan was also provided for proposed improvements at LLDPE unit, consisting of adding new storm water trenches and adding new elutriators (no bid information provided). Based on the similarity of operations between the different manufacturing units at the facility, equivalent source control changes may be needed at all five units that produce pellets (LLDPE, PEI, PPI, PEII and PPII).

Source control improvements should also be made at the PVC and SPVC units that produce powders. I have not proposed source control for powders, nor have I reviewed any proposals to Formosa to reduce powder loss.

Finally, assuming that effective source controls as those described for the HDPE1 area (proposed by either PKW/PEI or Chem Engineering Ltd in documents FCP031722-31731, FPC033313-FPC033325, FPC033326-33329, and FPC031733-31746) are installed and maintained at each of the pellet manufacturing areas, it is possible that at least partially and indirectly potential discharges of pellets through Outfall 001 may decrease. However, it remains uncertain to me if those controls would address all source areas discharging towards the Wastewater Treatment Plant (CWTP) would be comprehensively covered. Therefore, the pretreatment system proposed for the CWTP in my Expert Report remains my recommendation. The cost of that pretreatment system is estimated at \$216,000. (Expert Report at 50)

In my opinion, given the information available to me at this time, it is reasonable to use these the source control bids as the bases for estimating costs for improvements suited to limit pellet and powder discharges from Formosa's facility. Also, if Formosa's intent is to construct a zero-discharge system as the means of pellet and powder control at the facility, their proposed South Pond could provide an approximate cost that can be utilized in lieu of the proposed stormwater ponds in my Expert Report. Under this assumption, Exhibit A lists the cost associated with the bids and gives a final estimate for necessary improvements as described in the bids and includes the pretreatment system for the CWTP.

ATTACHMENT A:

[REDACTED]

Summary

The total preliminary amount necessary for [REDACTED]
[REDACTED]
[REDACTED]

Basis

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Pretreatment System at Wastewater Treatment Plant

\$216,000

[REDACTED]

[REDACTED]