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June 18, 2012

Via Hand Delivery

The Honorable Lisa P. Jackson
Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Mail Code: 1101A
Washington, DC 20460

Re: Petition of the Vinyl Institute, Inc. for Reconsideration and Request to Stay the Rule Pending Reconsideration; Docket ID No. EPA-HQ-OAR-2002-0037

Dear Administrator Jackson:

On behalf of our client, the Vinyl Institute, Inc. ("VI") and its PVC MACT Working Group, please find enclosed a Petition for Reconsideration and Request to Stay the Rule Pending Reconsideration for the final *National Emission Standards for Hazardous Air Pollutants for Polyvinyl Chloride and Copolymers Production*, 77 Fed. Reg. 22,848 (April 17, 2012).

VI commends the Agency and its staff for their professionalism, transparency, and diligence throughout the rulemaking process. VI also wishes to recognize the Agency's thorough review and consideration of information submitted during the course of this rulemaking. As with any sizeable undertaking, however, there remain some outstanding issues that must be addressed through the Agency's Clean Air Act § 307(d)(7)(B) reconsideration authority.

Should you have any questions, please do not hesitate to contact me.

Respectfully Submitted,

Jean-Cyril Walker

Enclosures

cc: Penny Lassiter, USEPA, Sector Policies and Programs Division
Jodi Howard, USEPA, Office of Air Quality Planning and Standards
Patricia Embrey, USEPA, Air and Radiation Law Office, EPA Office of General Counsel
Mark Kataoka, USEPA, Air and Radiation Law Office, EPA Office of General Counsel

BEFORE THE
U.S. ENVIRONMENTAL PROTECTION AGENCY

In re: *National Emission Standards for Hazardous Air Pollutants for Polyvinyl Chloride and Copolymers Production*, 77 Fed. Reg. 22,848 (April 17, 2012)	)))))	Docket ID No. EPA-HQ-OAR-2002-0037

PETITION OF THE VINYL INSTITUTE, INC. FOR RECONSIDERATION AND REQUEST TO STAY THE RULE PENDING RECONSIDERATION

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June 18, 2012

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I. Introduction and Summary

Pursuant to Section 307(d)(7)(B) of the Clean Air Act, 42 U.S.C. § 7607(d)(7)(B), the Vinyl Institute ("VI"), on behalf of its PVC MACT Working Group ("Working Group"),[1] hereby requests that the Administrator of the U.S. Environmental Protection Agency ("EPA" or "Agency") reconsider and stay the implementation of specified provisions of the final *National Emission Standards for Hazardous Air Pollutants for Polyvinyl Chloride and Copolymers Production* (hereinafter, "PVC MACT") rule for major and area sources.[2] Working Group members manufacture the majority of the U.S. production volume of homopolymer polyvinyl chloride ("PVC") and copolymer resins, and provided detailed comments to EPA's proposal to set Clean Air Act ("CAA" or "the Act") maximum achievable control technology ("MACT") emissions limitations for PVC and copolymer production facilities.[3]

After almost four years, several public meetings, hundreds of public comments, and over $12 million spent by Working Group members to collect emission data and respond to several Agency information requests, EPA issued its final PVC MACT rule on April 17, 2012. The Working Group commends the Agency and its staff for their professionalism, transparency, and diligence throughout the rulemaking process. The Working Group also wishes to recognize the Agency's thorough review and consideration of information submitted during the course of this rulemaking, including the information contained in the Working Group comments on the proposal,[4] and the comments provided by other industry associations and the individual companies that produce PVC and copolymer resins.[5]

As with any sizeable undertaking, the Working Group has identified 50 or so ambiguities and issues of concern that must be addressed before the rule is implemented. Most of these issues can be resolved through Agency guidance and clarification, and the industry looks forward to working with EPA to resolve these outstanding questions. There remain, however, several errors, textual ambiguities or conflicts, and regulatory oversights that require substantive changes to the final PVC MACT rule, and thus, must be addressed now through the Agency's reconsideration authority:

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[1] In addition to Vinyl Institute ("VI") members Formosa Plastics Corporation, U.S.A., Occidental Chemical Corporation/Oxy Vinyls, LP, PolyOne Corporation, Shintech Inc., and Westlake Chemical Corporation, the PVC MACT Working Group includes non-VI members The Dow Chemical Company and Georgia Gulf Corporation. The Vinyl Institute, Inc., founded in 1982, is a U.S. trade association representing the leading manufacturers of vinyl, vinyl chloride monomer, vinyl additives and modifiers, and vinyl packaging materials.

[2] 77 Fed. Reg. 22,848 (April 17, 2012).

[3] Docket Document No. EPA-HQ-OAR-2002-0037-0118, *Comment submitted by Jean-Cyril Walker, Keller and Heckman LLP on behalf of The Vinyl Institute, PVC MACT Working Group.*

[4] Docket Document No. EPA-HQ-OAR-2002-0037-0118; Docket Document No. EPA-HQ-OAR-2002-0037-0146; Docket Document No. EPA-HQ-OAR-2002-0037-0168.

[5] Docket Document No. EPA-HQ-OAR-2002-0037-0134; Docket Document No. EPA-HQ-OAR-2002-0037-0139; Docket Document No. EPA-HQ-OAR-2002-0037-0154; Docket Document No. EPA-HQ-OAR-2002-0037-0142; Docket Document No. EPA-HQ-OAR-2002-0037-0144; Docket Document No. EPA-HQ-OAR-2002-0037-0151; Docket Document No. EPA-HQ-OAR-2002-0037-0153; Docket Document No. EPA-HQ-OAR-2002-0037-0160.

- **Process wastewater limit for non-vinyl chloride ("non-VC") total organic hazardous air pollutants ("TOHAP")** – EPA changed its methodology for setting limits on non-VC TOHAPs in process wastewater after the close of the comment period. The Working Group does not object, in concept, to the new methodology, but EPA did not provide an opportunity to comment on the new approach, nor did the Agency request or use a sufficient amount of non-VC TOHAP analytical data to set the resultant limits. EPA had only nine HAP data points from industry responses to a survey question for use in setting the non-VC TOHAP limit, one of which was later found to have been inadvertently obtained from outside the source category. Of the eight remaining data points, several were based on engineering estimates, and altogether addressed only three of the 30 listed HAPs regulated by the rule. Accordingly, the final process wastewater limits for TOHAPs, which decreased almost ten-fold from the proposed limit, from 1,000 parts per million ("ppm") to 110 ppm TOHAP at existing major sources, and to 0.018 ppm for existing area sources and all new sources, do not reflect the emissions limitations actually achieved by the five best performing facilities in the source category, as required by the Act.

- **Vent gas absorbers ("VGA")** – The Agency's TOHAP emission limits for process vents are based on the use of thermal oxidizers as the control device for process vent gas. In their comments, the PVC industry had argued that the PVC MACT should take emissions rates into consideration when setting limits for VGAs because of the significant difference in flow rates between VGAs and thermal oxidizers. In the preamble to the final rule, EPA indicated that it had considered setting alternative formats for the process vent emission limits, but did not have sufficient data on process vent stream flow rates and concentrations to develop or evaluate other emission limit formats, such as mass emission rates for VGAs. Based on Working Group discussions with Agency staff during an April 18, 2012 meeting, it appears that EPA may have missed this information, which was included in a spreadsheet responding to the Agency's Section 114 data collection request, and as such, limits for VGAs were not properly considered.

- **Bypasses from closed vent systems** – Under the final rule, the opening of valves and other equipment during routine maintenance activities and other operations, even after the rule's equipment clearing/opening procedures have been performed and associated emission limits are met, constitutes a violation. The industry agrees in general that, as EPA states in its *Summary of Public Comments and Responses,*[6] no unauthorized release of a "regulated vent stream" from such equipment should be allowed. However, under the current regulatory text, it appears that a bypass would include the opening of valves and other equipment during routine maintenance and other operations, and each such bypass release is declared a "violation," regardless of the circumstances, even after the rule's equipment clearing/opening procedures have been performed such that the equipment or valve is no longer "in HAP service," as defined

[6] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 10-26, *Summary of Public Comments and Responses, National Emission Standards for Hazardous Air Pollutants for Polyvinyl Chloride and Copolymers Production, February 2012.*

at Section 63.12005. However, it is not reasonable or required under the CAA for EPA to promulgate a rule that prohibits routine maintenance and other operations on process equipment or vent systems. In addition, EPA should have considered and allowed the ongoing use of parametric and other monitoring equipment and practices at existing facilities, which provide near real-time notification of bypasses, including bypasses for maintenance, as an alternative to the apparent prohibition of maintenance bypasses and the required installation of flow monitors, key locks, or car-seals on the hundreds or thousands of valves at a typical facility.

- **Pressure relief device requirements** – The final rule unnecessarily requires some form of lift indication or flow detection, and alarms on all pressure relief devices ("PRD") to *notify* facility operators and determine the duration of a PRD release *after* it has occurred. However, EPA failed to consider current equipment and practices at PVC facilities that are in place to *prevent* and provide *immediate* notice of PRD releases. In addition, the Agency's economic analysis was fundamentally flawed, as it relied on unrealistic cost assumptions that significantly undervalue the economic burden of this requirement.

- **Leak detection but no repair for pressure vessels** – Under the final rule, facilities must monitor pressure vessels such as storage spheres for leaks, but any detected leak is an automatic violation. This is contrary to a fundamental premise embedded in the Agency's long-standing leak detection and repair ("LDAR") programs and other more recent MACT standards, that a leak is not considered a violation subject to enforcement if it is repaired within a defined timeframe. The Agency failed to identify any problems with existing LDAR programs for pressure vessels at PVC facilities or provide any rationale as to why PVC facilities should be treated differently from all other facilities with pressure vessels.

- **Vapor balancing** – The final PVC MACT does not allow the industry's existing practice vapor balancing and venting of tanks back to the process during loading and unloading operations. EPA recommends this approach in recent MACT proposals, but the PVC MACT is inexplicably silent on this procedure.

- **Overlapping rule requirements for control devices and emissions profiles on process vent streams** – The rule requires facilities handling vent streams from multiple facilities to comply with the most stringent rule applicable to their common control device, whether it is the HON, the PVC MACT, or another rule. The rule is silent and EPA was unable to answer, however, whether the most stringent standard extends back to all source operations up to and including operating parameters or applies only to the control device emission limits. Similar confusion surrounds EPA's requirement that facilities develop emissions profiles for all process gas streams leaving each process component which vent to a control device.

These matters are of central relevance to the implementation and enforcement of the PVC MACT, and will significantly hamper normal facility operations and compliance if left unaddressed.

II. Reconsideration and Stay of Certain Provisions of the PVC MACT by EPA is Warranted

Section 307(d)(7)(B) of the Act authorizes the Agency to reconsider a final rule under the CAA upon objection by a petitioner.[7] The EPA has no choice, and the Act directs that the Administrator "shall convene a proceeding for reconsideration," if the petitioner can meet two statutory preconditions. First, petitioners must demonstrate either that it was impracticable to raise an objection during the public comment period, or that the grounds for such objection arose after the period for public comment (but within the time specified for judicial review). Second, the objection must be of central relevance to the outcome of the rule.[8]

Regardless of whether a request meets the preconditions for mandatory reconsideration, the Agency also may exercise its own discretion to reconsider a rule. Although Section 112(d)(6) requires EPA to review and revise its MACT standards at least every eight years,[9] "nothing prohibits EPA from reassessing its standards more often."[10] Indeed, the Agency has in the past reviewed issues that did not strictly qualify for mandatory reconsideration under its Section 112(d)(6) authority.[11] Such review is particularly warranted where, as we discuss further below, errors in the data underlying the rule have been uncovered, the promulgated limits do not reflect emission levels actually achieved by the best performing sources, or the Agency did not "examine the relevant data and articulate a satisfactory explanation for its action[s]."[12]

Federal agencies also "have an obligation to deal with newly acquired evidence in some reasonable fashion,"[13] and to reexamine the assumptions and approaches underlying a rulemaking if there is a change in "a significant factual predicate."[14] This obligation rises to an imperative where, as here, the Agency itself identifies the data gaps that would have led it to consider a different approach or outcome. Considerations of practicability and whether petitioners had a meaningful opportunity to raise these issues prior to promulgation of the final rule also are relevant.[15]

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[7] 42 U.S.C. § 7607(d)(7)(B).

[8] *Id.*

[9] 42 U.S.C. § 7412(d)(6).

[10] *Portland Cement Ass'n v. EPA*, 665 F.3d 177, 189 (D.C. Cir. 2011).

[11] *See e.g., National Emission Standards for Hazardous Air Pollutants: Notice of Reconsideration*, 76 Fed. Reg. 15,266 (March 21, 2011).

[12] *Motor Vehicles Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983).

[13] *Portland Cement Ass'n*, 665 F.3d at 187 (citing *Catawba Cnty. v. EPA*, 571 F.3d 20, 45 (D.C. Cir. 2009).

[14] *Id.* at 187 (citing *Bechtel v. FCC*, 957 F.2d 873, 881 (D.C. Cir. 1992).

[15] *ICC v. Locomotive Engineers*, 482 U.S. 270, 280 (1987).

In this instance, the hundreds of pages of comments,[16] as well as the thousands of pages and megabytes of sampling data submitted by our small industry, not only reflect the complexity of this rulemaking, but also the limitations on our resources given the time constraints placed on the Agency by the Settlement Agreement prescribing the schedule for this rulemaking.[17] The Working Group very much appreciated the Agency's two-week extension of the comment period in response to our request for a 45-day extension. We also appreciated the Agency's willingness to consider a limited amount of post-comment submissions and sampling data as both EPA and the Working Group continued to identify substantive issues with the rulemaking.

Ultimately, the final rule would have benefitted from a deeper refinement that additional time would have allowed. Until EPA published its final rule, we were not able to "divine the agency's unspoken thoughts."[18] In some cases, those thoughts remain as shielded now as they did during the rulemaking. Ultimately, the Agency needs to "get it right." "Reasoned decisionmaking is not a dispensable part of the administrative machine that can be blithely discarded even in pursuit of a laudable regulatory goal,"[19] or an arbitrary schedule negotiated by third parties.

Each of the issues raised by this petition involves some or all of the principles summarized above. For all of these reasons, and as detailed further below, the Working Group urges the Administrator to stay the effectiveness of the rule pending reconsideration of the issues specified in the next sections, and to "convene a proceeding for reconsideration…and provide the same procedural rights as would have been afforded had the information been available at the time the rule was proposed."[20]

III. Data Errors Mandate Reconsideration of the Process Wastewater TOHAP Limit

In its notice of proposed rulemaking,[21] EPA did not propose a MACT floor limit for total HAP in wastewater. Instead, EPA proposed as a beyond-the-floor "HAP emissions reduction approach," a 1,000 ppm by weight ("ppmw") threshold for total organic HAP (including vinyl chloride), above which facilities would have been required to comply with the wastewater provisions of the Hazardous Organic NESHAP ("HON").[22] Following the close of the comment period, EPA rejected this approach for the final rule. The Agency decided that all process wastewater streams "must meet a limit for total non-vinyl chloride organic HAP that is

[16] *See* Docket Document Nos. EPA-HQ-OAR-2002-0037-0134; EPA-HQ-OAR-2002-0037-0139; EPA-HQ-OAR-2002-0037-0154; EPA-HQ-OAR-2002-0037-0142; EPA-HQ-OAR-2002-0037-0144; EPA-HQ-OAR-2002-0037-0151; EPA-HQ-OAR-2002-0037-0153; EPA-HQ-OAR-2002-0037-0160.

[17] *See Proposed Settlement Agreement, Clean Air Act Citizen Suit*, 74 Fed. Reg. 58,955 (Nov. 16, 2009).

[18] *Environmental Integrity Project v. EPA*, 425 F.3d 992, 996 (D.C. Cir. 2005) (quoting *Shell Oil*, 950 F.2d 741, 751 (D.C. Cir. 1991)).

[19] *Portland Cement Ass'n*, 665 F.3d at 188.

[20] *American Petroleum Institute v. Costle*, 665 F.2d 1176, 1192 (D.C. Cir. 1981) (citing 42 U.S.C. § 7607(d)(7)(B)).

[21] *See National Emission Standards for Hazardous Air Pollutants for Polyvinyl Chloride and Copolymers Production; Proposed Rule*, 76 Fed. Reg. 29,528 (May 20, 2011).

[22] 76 Fed. Reg. 29,586.

significantly lower than the proposed 1,000 ppmw threshold."[23] Specifically, EPA set a 110 ppmw TOHAP limit for process wastewaters at major sources, and a 0.018 ppmw for existing area sources and all new sources.

A. Grounds for the Objection Arose After the Close of the Comment Period

Reconsideration of the wastewater TOHAP limits is warranted because the grounds for such objection did not arise until after the close of the public comment period. This factor raises concerns over the adequacy of notice and opportunity to comment on the final limits. The D.C. Circuit generally has held that "an agency's proposed rule and its final rule may differ only insofar as the latter is a 'logical outgrowth' of the former."[24] A final rule is a "logical outgrowth" of a proposed rule "only if interested parties should have anticipated that the change was possible, and thus reasonably should have filed their comments on the subject during the notice-and-comment period."[25] Anticipating the change in a final rule does not mean that the public must "divine the agency's unspoken thoughts," nor did the Working Group.[26]

As noted above, EPA did not propose a MACT floor for total HAP in wastewater or solicit comment on such a limit. Indeed, the MACT floor background document only discusses the establishment of a floor for vinyl chloride.[27] The NPRM gave no indication that EPA was considering any limit for wastewater HAP other than the 1000 ppmw threshold for HON requirements, as the Agency's only request for comments concerned maintenance wastewater:

> *We are requesting comment on whether maintenance wastewater should have separate limits from inprocess wastewater. We are also soliciting additional data relevant to setting a maintenance wastewater MACT standard.*[28]

The industry did address EPA's inquiry concerning maintenance wastewater. However, the Agency quite categorically and emphatically endorsed its HON-based approach for process wastewater, such that the final limit came as quite a surprise to the PVC industry:

> *The analysis previously conducted for the HON is applicable to PVC, because the cost-effectiveness of wastewater treatment depends on the wastewater flow and HAP concentration, not on the type of process unit from which the wastewater stream is generated. The same treatment systems (steam stripping or biotreatment), and the same measures to prevent atmospheric emissions from the*

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[23] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 13-69 to 13-70.

[24] *See Envt'l Integrity Project v. EPA*, 425 F.3d 992, 996 (D.C. Cir. 2005) (applicable test is "whether a new round of notice and comment would provide the first opportunity for interested parties to offer comments that could persuade the agency to modify its rule").

[25] *Northeast Maryland Waste Disposal Auth. v. EPA*, 358 F.3d 936, 952 (D.C. Cir. 2004).

[26] *Envt'l Integrity Project v. EPA*, 425 F.3d at 996 (citing *Arizona Pub. Serv. Co. v. EPA*, 211 F.3d 1280, 1299 (D.C. Cir. 2000)).

[27] Docket Document No. EPA-HQ-OAR-2002-0037-0100, at 20-23, and Attachment C, *Memorandum from Eastern Research Group, Inc. (ERG) to J. Howard, USEPA Subject: MACT Floor Analysis for the Polyvinyl Chloride and Copolymers (PVC) Production Source Category, April 11, 2011.*

[28] 76 Fed. Reg. 29,550.

> *systems conveying the wastewater streams to the treatment systems, are applicable to wastewater streams that meet these criteria. Furthermore, 35 percent of PVC production facilities are co-located with chemical manufacturing process units that are subject to the HON, and could potentially route PVC wastewater streams (if any) that meet the total HAP criteria to existing HON wastewater treatment processes to meet these limits…Based on information submitted by PVC production facilities, we are not aware of any wastewater streams from affected sources that are above these flow rate and concentration limits...However, the limit will ensure that, if there are any wastewater streams meeting the total HAP and flow rate criteria, they will be controlled.*[29]

Critically, when the PVC industry met with EPA on June 30, 2011, to discuss the proposed rule and the Agency's additional data needs, the industry understood that Agency staff was only requesting additional data for vinyl chloride in wastewater. Indeed, the bulk of the wastewater discussion focused on developing sufficient data for a vinyl chloride limit. At the time, EPA gave no indication that it intended to change its approach to regulating total HAP in wastewater and impose a much lower limit of 110 ppmw for existing major sources, and 0.018 ppmw for existing area sources and all new sources. Industry had no notice of, or opportunity to comment on, the new approach. The ultimate TOHAP limits of 110 ppmw at existing major sources, and 0.018 ppmw for existing area sources and all new sources came as quite a surprise to the PVC industry.

B. It was Impracticable to Raise an Objection to the Process Wastewater Limit

Separate from the adequacy of notice, the D.C. Circuit has specifically addressed the bounds of the practicability for raising an objection that compels reconsideration:

> *While we certainly require some degree of foresight on the part of commenters, we do not require telepathy. We should be especially reluctant to require advocates for affected industries and groups to anticipate every contingency. To hold otherwise would encourage strategic vagueness on the part of agencies and overly defensive, excessive commentary on the part of interested parties seeking to preserve all possible options for appeal. Neither response well serves the administrative process.*[30]

It is important to note that Working Group objections to the wastewater TOHAP limit are rather narrow. We support EPA's conceptual approach and calculation method for setting the process wastewater limits in the final rule, and only object to the incorrect and insufficient number of data points selected and used to calculate the limit. Following publication of the final rule, Working Group members examined the underlying data and found significant errors and issues with the very limited data set used by EPA. It is at this point that notice and practicability overlap. Had the Agency proposed the TOHAP limit and provided its floor calculations during the public comment period, it is likely that industry members would have spotted the data gaps and mistakes and collected the appropriate additional sampling information to buttress the

[29] 76 Fed. Reg. 29,549.

[30] *Portland Cement Ass'n*, 665 F.3d at 186.

record. Or, if EPA had indicated during our June 30, 2011 meeting that TOHAPs in wastewater were an issue, additional testing might have been conducted. After all, the industry did provide four years of additional vinyl chloride wastewater data to EPA with its comments on the proposed rule.

Without the Agency's calculations in hand, however, it was not possible to readily identify the incorrect data points and incorrect data uses that are discussed in greater detail in the next section. The length and scope of the industry comments are evidence of a tremendous industry effort to provide the Agency with the appropriate data needed to successfully complete this rulemaking. The accompanying data submissions, which were planned, collected, analyzed, and reported over the mere 10 weeks allocated for public comment, speak to the impracticability of anticipating the TOHAP contingency, particularly in the absence of any hint from EPA. This is not to fault the Agency's efforts in this rulemaking, particularly given its obligations to promulgate several other MACTs within the same time frame. The fact remains, however, that as discussed further in the next section, the final wastewater TOHAP limits deviate from the CAA § 112(d)(3) requirement that MACT floors must be based on emission levels actually achieved by the best performing sources in the source category. As such, the administrative record does not support a conclusion that the facilities selected for the Agency's floor calculations represent the best performing sources in the industry.

C. *TOHAP Data Does not Reflect Emission Levels Actually Achieved*

The Working Group was unable to locate any rationale for the change in TOHAP limit in any of the background documents released to the docket.[31] The closest discussion on point, which can be found at pages 13-69 of the *Summary of Public Comments and Responses, National Emission Standards for Hazardous Air Pollutants for Polyvinyl Chloride and Copolymers Production*, suggests that the Agency failed to first develop a wastewater MACT floor before seeking to impose the HON requirements as a beyond-the-floor limit.[32] For the final rule, the Agency calculated a non-vinyl chloride total organic HAP limit for process wastewater, based on non-VC organic HAP data reported by PVC facilities in response to the Section 114 Request and using the same calculation methodology used to determine the limit for vinyl chloride. The resulting limits are as follows:

Table 1: Final PVC MACT Wastewater Stripper Outlet Concentration Limits (in ppmw)

Pollutant	Existing Major Sources	New Major Sources	Existing Area Sources	New Area Sources
Vinyl Chloride	6.80	0.28	2.1	2.1
Non-VC TOHAP	110	0.018	0.018	0.018

On its face, the 0.018 non-VC TOHAP limit for existing area sources and all new sources should have been an immediate red flag to EPA, as it was to the PVC industry, that a problem exists with the data. The TOHAP limit for existing sources is one order of magnitude higher

[31] *See, e.g.*, Docket Document No. EPA-HQ-OAR-2002-0037-0193, *Memorandum from Eastern Research Group, Inc. to Jodi Howard, USEPA, Subject: Revised Maximum Achievable Control Technology (MACT) Floor Analysis for the Polyvinyl Chloride and Copolymers (PVC) Production Source Category, February 8, 2012.*

[32] *See* Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 13-69 to 13-70.

than the VC limit, yet the TOHAP limit for new and area sources, which uses the same stripping technology, is two orders of magnitude less than the VC limit.

Working Group members reviewed the Microsoft Excel™ spreadsheet EPA used to calculate the wastewater limits, and determined that the 0.018 ppmw value used to set the new source wastewater TOHAP limit had been reported by an area source facility. Upon further review of the source of this data point, the facility determined that it had inadvertently reported the value for a single analyte from a groundwater remediation stripper located next to its PVC plant rather than from the PVC wastewater stripper at the facility. *See* **Exhibit I**. Consequently, as previously communicated to the Agency, the 0.018 ppm by volume ("ppmv") data point is not valid for use in setting a MACT emissions limit for PVC facilities.

The other few data points EPA used to calculate the TOHAP limit also do not reflect the emission levels actually achieved by the industry. The Agency calculated MACT floors for total non-VC organic HAP in wastewater using data from Sheet K-3-b of its Section 114 Survey.[33] The information requested by EPA, and provided by PVC facilities in most instances, was for 2008 data on hand. Significantly, the Agency did not ask for new sampling and analysis for wastewater HAPs. In this regard, it is important to remember that compliance with the Part 61 Vinyl Chloride NESHAP applicable to all PVC facilities did not require the collection of non-VC data. Thus, any non-VC wastewater HAP data collected by PVC facilities would be limited to those few HAPs that may be of interest for a particular purpose, such as product quality control, meeting an existing permit limit, or to support a permit modification or renewal application. Nor was the industry aware of the use EPA intended for this data until EPA released the final rule. As the table below indicates, the scarcity of non-VC HAP data available to EPA is quite apparent when the "Baseline and Reduction Estimate" tab of EPA's wastewater spreadsheet is examined.

In short, EPA had only six reported values (including the invalid 0.018 ppmw value for Oxy Vinyls Deer Park) for only three of the 30 HAPs the Agency's non-VC TOHAP limit is intended to address. (MIBK reported for the Shintech facilities is a site-specific HAP which is not on the list of 30 HAPs EPA identified in Table 10 of the final rule.) Critically, and as **Table 2** indicates, most of these values do not reflect actual samples of PVC facility wastewaters, taken during actual operations. Nor is it clear that the facilities reporting represent the best performing facilities in the industry.

The Working Group is aware of at least one company that submitted wastewater-sampling data in September 2010, covering a site-specific list of 20 HAPs for one of its facilities,[34] but EPA did not use this data in calculating the floors. *See* **Exhibit II**. It is not clear whether the Agency overlooked the data because the data set is not addressed in the background documents to the final rule. **Table 2** clearly indicates, however, that EPA should have accounted for other HAPs identified in the September 2010 data set, such as acetophenone, chloroethane, chloroform, and formaldehyde, when setting the final non-VC TOHAP limit.

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[33] Docket Document No. EPA-HQ-OAR-2002-0037-0193, at 38, 41-42.

[34] The wastewater stripper in question is from the OxyVinyls, LP's Pasadena, TX facility. The submission also included centrate wastewater data from the OxyVinyls, LP's Pedricktown, NJ facility, which is not relevant here.

Table 2: Non-VC HAPs Reported to EPA Before Close of Comment Period (in ppmw)

Company & Facility	Acetaldehyde	EDC	Methanol	MIBK*	Chloroethane	Chloroform	Acetophenone	Formaldehyde	Source	
Certain Teed Lake Charles	--	--	--	--					--	
Dow Midland	--	--	--	--					--	
Formosa Baton Rouge	--	0.3	--	--					Calculated average EDC trend data from 2005 sample with all constituents below detection limit	
Formosa Delaware	--	--	--	--					--	
Formosa Point Comfort	--	--	--	--					--	
Formosa SPVC[35]	NA	NA	NA	NA					Unit under construction during survey period	
OxyVinyls Deer Park	0.018	--	--	--					Groundwater remediation stripper sample	
OxyVinyls Pasadena	--	--	--	--					--	
OxyVinyls Pedricktown	--	--	--	--					--	
PolyOne Henry	--	--	--	--					--	
PolyOne Pedricktown	--	--	--	--					--	
Shintech Addis	--	--	40	0.26					Engineering estimates	
Shintech Freeport	--	--	39	0.259					Sampling results	
Shintech Plaquemine	--	--	40	0.3					Engineering estimates	
Westlake Calvert City	--	--	2.26	--					Material balance	
Westlake Geismar	--	--	--	--					--	
Georgia Gulf Aberdeen	--	--	--	--					--	
Georgia Gulf Plaquemine	--	--	--	--					--	
OxyVinyls Pasadena	0.844	0.0027	656	--	ND	ND	5.22	0.025	December 22, 2009	**All six samples taken during 30-day test period in response to EPA 114 letter
	0.01	0.0028	858	--	0.0028	0.0043	9.11	ND	December 29, 2009	
	8.37	ND	806	--	ND	ND	4.79	0.162	January 6, 2010	
	0.085	ND	490	--	ND	ND	9.01	0.085	January 12, 2010	
	ND	0.0026	265	--	0.0058	ND	9.19	ND	January 19, 2010	
	2.11	ND	620	--	ND	ND	9.95	ND	January 28, 2010	

*Site-specific HAP

[35] The Formosa Specialty PVC ("SPVC") facility in Point Comfort, TX, submitted a response to the Section 114 Survey, but was not operating during the Section 114 sampling period. SPVC should be included on reconsideration as it is an exisiting PVC Unit that is currently operating.

The addition of a few more HAPs from just one facility would have resulted in a significant change in the non-VC TOHAP limits, confirming that the final non-VC TOHAP limit does not reflect emissions limitations actually achieved by the best performing facilities.

It is important to note that this data set does not include the majority of facilities in the industry. When an even larger set of data is evaluated, as illustrated in Section D, it is abundantly clear that the TOHAP limits for new and existing sources do not comport with the Clean Air Act as they do not reflect emission levels actually achieved by the best performing sources.

D. Non-Vinyl Chloride TOHAP Wastewater Floor Must be Recalculated to use Actual Sampling Data Reflecting Actual Operating Conditions

Recognizing the limitations of the non-VC TOHAP data set summarized above, Working Group members decided to sample their wastewater stripper(s) bottom discharge for all 30 HAPs listed by EPA in the final rule. Samples were collected and analyzed using the test methods specified by EPA in the final rule. Given the limited time to file this petition, not all facilities could fully participate in this exercise. Where possible, existing data from other wastewater tests also was included.

At a minimum, the database accompanying this petition as **Exhibit III** demonstrates that the data used by EPA to calculate non-VC TOHAP limits significantly underreported the HAPs in PVC facility process wastewaters. That data has been reviewed and analyzed for the top five performers, and subsequently utilized to calculate a statistically derived upper predictive limit ("UPL") value using EPA's methodology. The Working Group's recalculated wastewater stripper discharge non-VC TOHAP limitations are set out in **Table 3**, and better reflect the emissions limitations actually achieved by the best performers in the industry.

Table 3: Recalculated Wastewater Stripper Discharge Non-VC TOHAP Limitations (in ppmw)

	Existing Major Sources	New Major Sources	Existing Area Sources*	New Area Sources*
Non-VC TOHAPs	240	20	120	120
*For area sources, we do not have information from Certain Teed				

Indeed, **Table 4** illustrates how the array of five best performing facilities has changed with this more expansive data set.

Table 4: Best Performing Facilities for Non-VC TOHAP

Final PVC MACT Rule	New Wastewater Data
OxyVinyls – Deer Park	PolyOne – Henry
Formosa – Baton Rouge	Formosa - SPVC
Westlake – Calvert City	OxyVinyls – Deer Park
Shintech – Freeport	Westlake – Calvert City
Shintech – Addis	PolyOne – Pedricktown

The values set out above are not submitted as replacement limits, but rather to illustrate the extent to which the wastewater non-VC TOHAP limits of the final rule do not reflect the emissions limitations actually achieved by the five best performing facilities, assuming for the sake of illustration that the OxyVinyls' area source should appropriately be included in the MACT floor calculation. The wastewater samples and calculations underlying these values are the most comprehensive data set that Working Group members could collect between issuance of the final rule and the deadline for filing this petition. Working Group members expect that additional data would be obtained to address any Agency data gaps during reconsideration.

The Excel spreadsheets explaining this evaluation are included in the separate electronic submittal to EPA, and in **Exhibit III**. Against this backdrop, it is evident that EPA did not fulfill its obligations to base the MACT floor on actual emissions data reflecting actual operational performance.[36] As the Agency has not demonstrated that these limits are *actually achieved* and the grounds for objecting to the final limits arose after the close of the public comment period, reconsideration of the wastewater stripper discharge non-VC TOHAP limits is warranted and required under the Act.

IV. EPA Should Have set Process Vent Limits for Vent Gas Absorbers ("VGAs")

The Working Group concurs with and supports the petition for reconsideration on this issue filed by PolyOne Corporation. The final PVC MACT limits for process vents are based on the use of thermal oxidizers as the control device. Three PVC facilities, however, use vent gas absorption ("VGA") as vinyl chloride monomer ("VCM") recovery systems,[37] which represent a radically different technology for controlling emissions from these streams. Thus, in their comments on the proposed rule, the Working Group argued that the Agency should recognize that VGAs are a "recovery" control technology, and requested that VGAs be regulated as a separate subcategory with equivalent MACT floor performance limits based on mass emission rates.[38]

A. Reconsideration of VGA-Specific Emission Limits is Warranted as EPA Failed to Review the Information it Deemed Necessary but Already had in its Possession

In the preamble to the final PVC MACT, EPA acknowledges the VGAs recovery function and noted that it did consider:

> *...setting alternative formats for the process vent emission limits. However, we did not have sufficient information provided from industry on process vent stream flow rates and concentrations to develop or evaluate other formats, such as mass emission rates.*[39]

In fact, contrary to EPA's claimed lack of information, data on stream flow rates and concentrations for all process vents were provided to EPA as part of the response to the Agency's Section 114 Request. Flow rate and concentration for each device, including data for VGAs, can be found in the various EPA spreadsheets submitted as part of each PVC facility's

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[36] *Mossville Environmental Action Now v. EPA*, 370 F.3d 1232, 1242 (D.C. Cir. 2004) (in setting the MACT floor, EPA must "support[] its decision with record data that shows the connection between its MACT floor and the top performing plants").

[37] VGAs are located at the PolyOne facilities at Pedricktown, NJ and Henry, IL. The OxyVinyls facility at Pedricktown, NJ shares the VGA at PolyOne's Pedricktown facility.

[38] Docket Document No. EPA-HQ-OAR-2002-0037-0146, at 52.

[39] 77 Fed. Reg. 22,869.

stack sampling submission and posted to the rulemaking docket as **Document No. EPA-HQ-OAR-2002-0037-0107**. The chart included as **Exhibit IV** identifies the location of the flow rate and concentration data for each facility by Spreadsheet Name, Worksheet Name, and Cell Range.

An extensive report of the stack sampling performed at each PVC facility also was prepared by industry, describing in detail the sampling locations, quality assurance and quality control steps, and sample collection and analytical procedures. These reports, which were submitted as part of each Working Group member's Section 114 response, but do not appear in the docket, also provided flow rate and concentration information, including total hydrocarbons ("THC"). Given the amount of data submitted and available to EPA, it was arbitrary and capricious for the Agency not to have considered creating a process vent subcategory for VGAs. Accordingly, EPA should reconsider the industry's request to subcategorize VGAs.

B. Subcategorization of VGA is Warranted

Section 112(d)(1) of the Act authorizes EPA to "distinguish among classes, types and sizes of sources within a category or subcategory."[40] In addition, subsections 112(d)(2) and (3) pervasively refer to standards for sources in each "category or subcategory." Thus, it is appropriate for EPA to subcategorize process vent limits by differences in devices, provided such categorization is reasonable. In this instance, subcategorization is not only reasonable; it is necessary to prevent a manifest injustice.

The VGAs at both PolyOne facilities were installed to meet the requirements of the Part 61 Vinyl Chloride NESHAP. As described in the PolyOne petition for reconsideration, the VGA uses cold isooctane to absorb the residual VCM supplied by the closed vent system, then heats the isooctane to remove the VCM from the isooctane, and condenses and returns the VCM back into the production process. The hot isooctane is cooled for reuse to absorb more VCM. The isooctane is the absorption media and is continuously reused within the VGA. As a result, the VGA effectively reuses 99.9% of the VCM entering the unit, as illustrated below.

Unlike a thermal oxidizer, VGAs are not combustion devices and, accordingly, have significantly different emissions to the atmosphere. Dioxins, HCl, and greenhouse gases are not produced or released by this technology; isooctane is the measureable component in the THC measurement. Critically, the outflow from the VGA is intermittent and occurs at a very low rate. In contrast, the outlet volume flow from a thermal oxidizer is more than 100 times that from a VGA or 13.4+ dry standard cubic meters per minute ("dscmm") versus 0.0781 dscmm, respectively.[41] As a result, the concentration value or ppm volumetric dry ("ppmvd") for all HAPs or THC measured from intermittent VGA emissions is very high, but the actual mass emission rate is extremely low. More importantly, the emission profile of the two technologies varies significantly. Whereas the HAPs emitted from the thermal oxidizer include dioxins, HCl, and greenhouse gases, among others, the emission composition of a VGA is limited to isooctane with minor contaminants of VCM and chloroethane.

[40] 42 U.S.C. § 7412(d)(1); *see also Sierra Club v. EPA*, 479 F.3d 875, 885 (D.C. Cir. 2007).

[41] Based on the concentration database used for the MACT limit calculations.

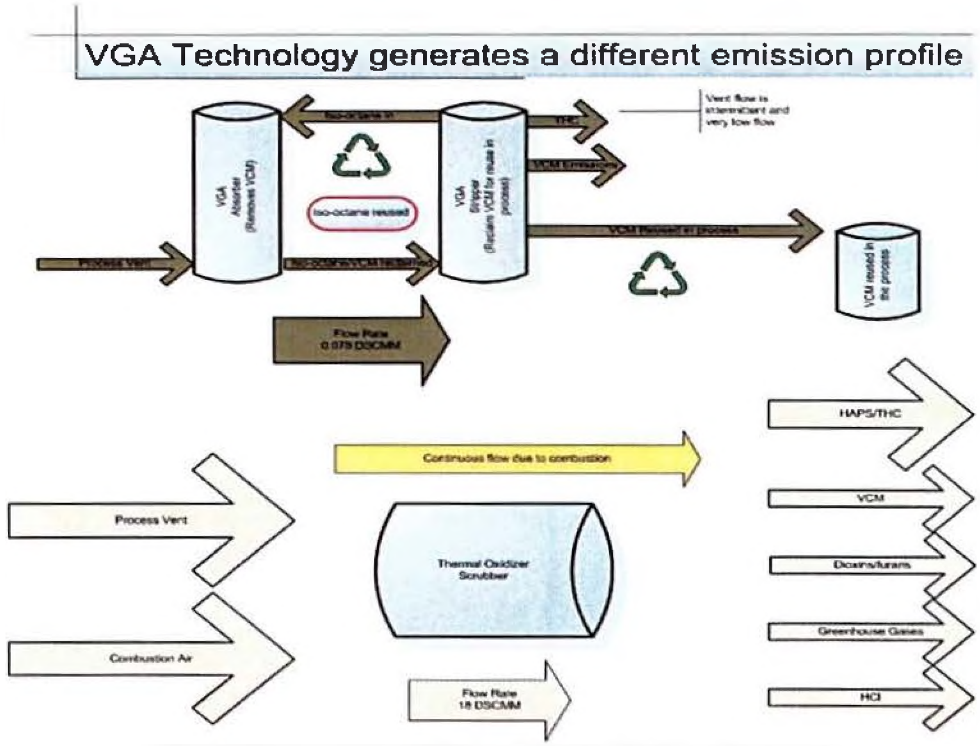

Figure 1: Comparison of VGA and Thermal Oxidizer Processes

In short, EPA should not apply limits based on combustion technology to a non-combustion recovery device. Stating total HAP or THC emissions in terms of mass flow is a more accurate and technically sound way of measuring performance and setting compliance limits for a VGA.

C. MACT Floor Analysis for VGAs

The PVC MACT process vent emission limits are presented in volumetric units corrected to 3 percent oxygen ("3% O_2"). The application of the 3% O_2 correction factor to emissions from a VGA, however, conflicts with the Agency's direction in the final rule that an O_2 correction factor should not be applied to emissions from non-combustion devices.[42] According to the Agency, application of the 3% O_2 factor was reasonable because:

> *Correction of pollutant concentrations to specified percent oxygen normalizes emissions data and allows for comparison of concentrations from sources with varying oxygen concentrations in the emission stream. Although typically applicable to combustion sources, such as thermal oxidizers, concentration correction for oxygen also applies to the use of VGA systems, such as those located of [sic] the PolyOne facilities as oxygen concentrations varied from 12.5 percent to 19.5.*[43]

[42] *See* 77 Fed. Reg. 22,923 (codified at 40 C.F.R. §§ 63.11945(d), (d)(3)).

[43] Docket Document No. EPA-HQ-OAR-2002-0037-0193, at 37.

The Agency's rationale is incorrect in this instance. The 3% O_2 correction is drawn from the HON and is intended to allow the addition of supplemental combustion air, but only provides credit for the amount needed for proper combustion. According to EPA, "this correction was not intended to apply to other types of control devices:"[44]

> *The value of 3 percent originates from good engineering practices. For oxygen deficient streams, if the proper amount of supplemental combustion air is added, the outlet stream would contain approximately 3 percent oxygen. Typically, SOCMI facilities have low oxygen, high VOC/HAP concentration streams that generally require supplemental combustion air when they are combusted. Therefore, a correction to prevent dilution was needed in rules for the SOCMI industry.*[45]

An oxygen correction is unwarranted for the VGAs because the VGA stream is not a combustion process, and thus no air needs to be added to overcome any possible oxygen deficiency. Any reported oxygen fluctuation is an artifact of the sampling point operation. Unlike in the combustion scenario, oxygen is not added upstream of the VGA, either because of an upset condition or intentionally to promote combustion. As the chart below illustrates, back drafting air from the vent stack control valve can cause O_2 levels detected at the sampling point to fluctuate from 12-15% up to 20%.

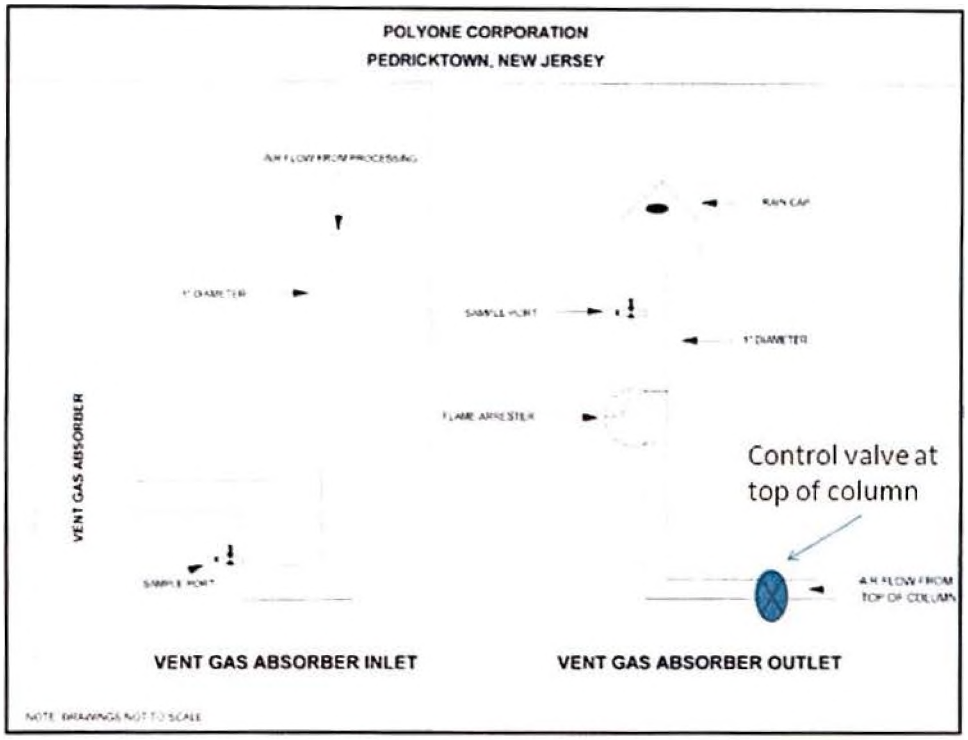

Figure 2: Vent Gas Absorber ("VGA") Sample Locations

[44] *See National Emission Standards for Hazardous Air Pollutants (NESHAP) for Pesticide Active Ingredient Production: Summary of Public Comments and Responses*, p. 15-3, EPA-453/R-98-011 (May 1999).

[45] *Id.*

Thus, application of the correction factor is unwarranted. We understand that PolyOne submitted a similar diagram to EPA with its stack test report in February 2010, and so the Agency should not have applied the 3% O_2 to the VGA data.

We would expect on reconsideration that use of a mass flow limit would obviate the need for the O_2 correction. Accordingly, we are resubmitting as **Exhibit V**, the data provided as part of the concentration database from PolyOne, which includes THC results during the stack test. THC data were collected every minute during the three four-hour tests. The average of each run was reported. PolyOne and the Working Group believe these data should be used to calculate a limit specifically for this unique technology. Using these data, the calculated limits would be:

THC 2.0 lb/hr max 3-hr block average

Because the Agency failed to consider information in its possession regarding the different control technology represented by VGAs, because subcategorization based on differences in control devices is warranted, and based on the preliminary profile of the MACT floor presented here, EPA must grant reconsideration on this topic and undertake a corrective rulemaking.

V. Provisions Concerning Bypasses From Closed Vent Systems Must be Revised

The final PVC MACT rule seeks to "ensure that emissions streams are properly routed to the closed vent system and delivered to the control device for reduction,"[46] before any release to the atmosphere. Accordingly, the final rule prohibits any "bypass" or diversion of such emissions from a control device. In EPA's view, most bypasses are caused by malfunctions, poor design, operator error, or similar incidents, and thus, exempting such occurrences from the requirement that MACT standards apply continuously is not justified. In order to ensure that PVC operators detect and identify bypasses, EPA is requiring the installation of a bypass flow indicator on valves and other components that are capable of diverting a regulated vent stream away from the control device directly to the atmosphere. In the alternative, facilities can use a car-seal or lock-and-key to secure valves and other components in a non-diverting position, subject to monthly inspections and recordkeeping.

There are thousands of valves and other pieces of equipment at each PVC facility that are covered by these requirements. Many are used frequently as part of normal operations or periodic maintenance activities after equipment opening requirements for evacuating the equipment have been met. Yet EPA has completely overlooked the impact of the bypass provisions on legitimate maintenance activities. As the final rule is currently worded, no maintenance activity involving the opening of these valves or other pieces of equipment can be performed without violating the Act, even if the vent stream is no longer in HAP service or otherwise regulated. Accordingly, reconsideration is warranted to resolve the textual conflict between the bypass provisions and the equipment opening requirements of the final rule.

Nowhere in the proposed or final rule, or the voluminous background documents does EPA provide a rationale for, or assess the cost/benefit of, requiring the installation of flow

[46] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 10-25.

indicators, key locks, or car-seals on the thousands of covered components at PVC facilities in what is clearly a beyond-the-floor requirement. In addition, ambient air monitoring systems and procedures currently required of the industry effectively provide the real-time indication EPA seeks with flow indicators, and certainly more timely notification that an unauthorized emission event has taken place than monthly inspections now imposed in the final rule. Yet the Agency refused to consider the effectiveness of these existing, in-place systems. Such a refusal is arbitrary and capricious and a violation of the Act. Accordingly, reconsideration of the flow indicator, key lock, or car-seal requirement is warranted, as discussed further below.

Manual vent valve discharges have always been prohibited under the VCM NESHAP.[47] The Agency has long recognized, however, that the PVC industry operates as a batch process, which necessitates frequent equipment openings, and thus included an equipment-opening standard in the VCM NESHAP.[48] The Agency correctly applied these practical considerations to the final PVC MACT:

> *In the final rule we are setting standards for this emission source based on vinyl chloride because the part 61 NESHAP, which constitutes the MACT floor level of control for reactor and equipment openings, requires work practices to specifically control vinyl chloride emissions. It is appropriate to continue to set the standards based on vinyl chloride because it will always be present at this emission point, and controlling it will control all other HAP.*[49]

In contrast, the Agency's current approach to bypasses stems from its view that the decision in *Sierra Club v. EPA*, 551 F.3d 1019 (D.C. Cir. 2008) requires the Agency to ensure that MACT emissions limitations apply continuously.[50] Even so, *Sierra Club* in no way prohibits EPA from setting work practice standards to function as continuous emissions controls in those situations, such as the equipment opening and other normal batch operations, where the criteria for setting work practice standards has been met. Indeed, EPA recognized the need to address batch operations in the final PVC MACT, but effectively negated the equipment opening standard with regulatory language that makes opening any valve under any circumstance a violation of the Act. Such a clear conflict in regulatory language mandates reconsideration by the Agency.

A. Bypass Provisions are Overbroad and Conflict With Equipment Opening Requirements of the Rule

Section 63.11955 of the final rule governing equipment openings requires that almost all of the HAPs be evacuated from the equipment before it is opened. Specifically:

> *Before opening any <u>process component</u> (including pre-polymerization reactors used in the manufacture of bulk resins) for any reason, the quantity of vinyl chloride must be reduced to an amount that occupies a volume of no more than*

[47] 40 C.F.R. § 61.64(a)(3).

[48] 40 C.F.R. § 61.65(b)(6).

[49] 77 Fed. Reg. 22,885.

[50] 77 Fed. Reg. 22,895.

> *2.0 percent of the component's or equipment's containment volume, or 25 gallons, whichever is larger, at standard temperature and pressure.*[51]

The term "process component" is defined broadly and includes the term "equipment," which is defined to include "each pump, compressor, agitator, pressure relief device, sampling connection system, open-ended valve or line, valve, connector and instrumentation system in HAP service…"[52]

Paragraph (c) of Section 63.11955 requires that "gas or vapor HAP removed from a process component in accordance with paragraphs (a) and (b) of this section must be vented to a closed vent system and control device meeting the requirements of §§63.11925 through 63.11950" before opening. As a result of the VCM NESHAP requirements, the longstanding practice in the PVC industry has been to clear PVC process equipment using either a vacuum system, nitrogen sweep, or hydraulic displacement, and then vent all of the regulated "waste gas" or "exhaust gas" streams to the control device before the equipment is opened to atmosphere.

Included as **Exhibit VI** is a generalized procedure for removing a VCM filter at a typical PVC facility. As long as these requirements were followed, an operator could open and maintain his equipment in compliance with the Act. The PVC MACT rule effectively adopted these NESHAP equipment opening requirements, and thus, opening valves on a process component to perform routine maintenance, or accessing sampling points or sampling connectors after clearing the process component of HAP in accordance with Section 63.11955, should not now constitute a violation of the Act.

As noted above, work practice standards are appropriate where a HAP "cannot be emitted through a conveyance designed and constructed to emit or capture such pollutant, or that any requirement for, or use of, such a conveyance would be inconsistent with any Federal, State or local law."[53] Clearly, residual HAP present at the time of equipment and valve openings used for batch and maintenance operations cannot be routed to a control device, hence the need for standards and procedures to ensure the equipment or valve no longer is in HAP service before opening. EPA creates significant confusion, however, when it states that:

> *…most bypasses from closed vent systems are caused by malfunctions or other occurrences (e.g., poor design, improper maintenance, or operational error) that do not justify an exemption from standards that, under the CAA, apply continuously.…each closed vent system must be designed and operated both to collect any gas or vapor HAP from each continuous process vent, miscellaneous process vent and batch process vent, or process component, and to route the collected vapors to a control device,* ***regardless of whether the closed vent system is "in HAP service"****.*"[54]

[51] 40 C.F.R. § 63.11955(a) (emphasis added).

[52] 77 Fed. Reg. 22,937 (to be codified at § 63.12005).

[53] 42 U.S.C. § 7412(h)(2)(A).

[54] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 10-30 to 10-31; 77 Fed. Reg. 22,858.

The final rule defines a "bypass" as "diverting **a process vent or closed vent system stream** to the atmosphere such that it does not first pass through an emission control device" (emphasis added). In turn, 40 C.F.R. § 63.11930(c) imposes the following prohibition:

> *For each* ***closed vent system*** *that contains a bypass as defined in §63.12005 (e.g., diverting a vent stream away from the control device), you must not discharge to the atmosphere through the bypass. Any such release constitutes a violation of this rule. The use of any bypass diverted to the atmosphere during a performance test invalidates the performance test. You must comply with the provisions of either paragraph (c)(1) or (2) of this section for each* ***closed vent system*** *that contains a bypass that could divert a vent stream to the atmosphere.*

The Working Group considered the possibility that the terms "closed vent system" and "process vent" must have some different meaning, such that EPA's use of one but not the other in Section 63.11930(c) limited the applicability of the bypass prohibition. The problem is that the two definitions are essentially circular and process vents appear to have been subsumed into the definition of a closed vent system. Specifically, the final PVC MACT rule defines a "closed vent system" at Section 63.12005 as "a system that is not open to the atmosphere and is composed of piping, ductwork, connections, and, if necessary, flow inducing devices that collect or transport gas or vapor from **an emission point to a control device**." A process vent is defined in Section 63.12005 as:

> *A vent stream that is the result of the* *manifolding* *of each and all batch process vent, continuous process vent, or miscellaneous vent resulting from the affected facility* ***into a closed vent system*** *and into a common header that is routed to a control device. The process vent standards apply at the outlet of the control device. A process vent is either a PVC-only process vent or a PVC-combined process vent. (Emphasis added.)*

It would appear, at least initially, that the term "emission point" is intended to provide some additional guidance. Although not defined in the PVC MACT, EPA has indicated this in the preamble to its recently proposed *National Uniform Emission Standards for Storage Vessel and Transfer Operations, Equipment Leaks, and Closed Vent Systems and Control Devices; and Revisions to the National Uniform Emission Standards General Provisions* ("Uniform Standards").[55] The Uniform Standards would implement a similar scheme for bypasses from closed vent systems. "The Uniform Standards have, in general, been modeled after the emission-point and emissions control-specific subparts of the Generic MACT,"[56] which defines an "emission point" as:

> *...* ***an individual*** *process vent, storage vessel, transfer rack, wastewater stream, kiln, fiber spinning line, equipment leak, or other point where a gaseous stream is released.*[57]

[55] *National Uniform Emission Standards for Storage Vessel and Transfer Operations, Equipment Leaks, and Closed Vent Systems and Control Devices; and Revisions to the National Uniform Emission Standards General Provisions*, 77 Fed. Reg. 17,898 (March 26, 2012).

[56] *See* 77 Fed. Reg. 17,902.

[57] 40 C.F.R. § 63.1101.

In other words, under the PVC MACT, a process component subject to the equipment opening procedures is an emission point, which is a process vent, which is a closed vent system. This terminology is of particular concern because in order "to ensure that any flow directed through a bypass is detected and identified by the operator,"[58] paragraphs (c)(1) or (2) of 40 C.F.R. § 63.11930(c) require the installation of a bypass flow indicator, or a car-seal or lock-and-key to secure bypass valves in the non-diverting position. EPA makes clear the intended outcome of these requirements:

> *for bypasses that do not contain an automatic flow control valve and have manual lock-and-key flow control valves,* ***anytime the manual valve is opened, it would result in a violation****. If you install and maintain a bypass flow indicator equipped with an automatic alarm system, then any indication of flow through the bypass is a violation, but the action of opening the valve is not a violation.*[59]

The Working Group has been unable to identify any provision in the final rule that differentiates these components such that the bypass provisions apply to some components but not others. Thus, as currently drafted, the bypass prohibition conflicts with the equipment opening procedures of the rule, and it appears that no maintenance activity involving the opening of a valve or other piece of equipment can be performed without violating the Act.

Moreover, it is not clear that EPA has fully considered the implication of the current language. For example, as currently defined, analyzer vents (*e.g.*, exhaust gas from a vinyl chloride gas chromatograph monitor or other continuous emission monitoring system ("CEMS")) qualify as bypasses. In contrast, the Uniform Standards address analyzer vents through the LDAR requirements for a "sampling connection system" (*i.e.*, lines that convent samples to analyzers and analyzer bypass lines), rather than considering them bypass violations or deviations.[60] If EPA continues to consider all bypasses violations under the PVC MACT, then any PVC Unit with analyzers that emit HAPs, such as exhaust gases from the Gas Chromatography ("GC") or Mass Spectrometry ("Mass Spec"), which are used to comply with the VCM NESHAP ambient air area monitoring system requirements, would be in continuous violation. Exhaust gas from analyzers has already been controlled and on reconsideration, EPA should clarify that analyzers are not subject to the bypass provisions of the final rule.

B. Requirements for Bypass Flow Indicators, Car-Seals, or Locks and Keys are Beyond-the-Floor Requirements Whose Costs and Benefits Should Have Been Analyzed

As EPA notes, the PVC industry has long been subject to a prohibition against certain types of bypasses under the VCM NESHAP.[61] It should thus be axiomatic that under the Act, the prohibition against these bypasses constitutes the MACT floor. Section 112(d)(3) of the Act

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[58] 76 Fed. Reg. 29,553.

[59] 76 Fed. Reg. 29,553.

[60] 77 Fed. Reg. 17,954 ("It is our intent that analyzer vents should be subject to the control requirements for sampling connection systems in 40 CFR part 63, subpart UU").

[61] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 10-30.

requires EPA to set standards that "shall not be less stringent" than the emission controls that have been "achieved in practice:"

> *...the statute's use of terms like "achieved" and "controlled" at the floor-setting stage urges EPA to focus on what sources have actually done to ameliorate the pollution caused by their particular set of inputs.*[62]

Section 112(d)(2) authorizes EPA to set emissions standards that are the most stringent EPA finds to be "achievable." Otherwise known as "beyond-the-floor" standards, the "achievable" standards obviously are more stringent than the § 112(d)(3) floor. As the D.C. Circuit explained, the CAA amendments of 1990 "now requires that beyond-the-floor standards be achievable and provides a framework for analyzing achievability, including consideration of cost, energy requirements, and other factors."[63] This analysis has been deemed so critical that in the absence of any type of quantification of benefits or costs, EPA may have "no basis for finding that, 'taking into account the cost,' emissions reductions from pollution prevention programs were 'achievable' as the statute uses the word."[64]

EPA's imposition of flow indicators, key locks, or car-seals constitute just such a beyond-the-floor standard for which the Agency should have considered a variety of factors, including cost. When the Working Group raised the issue at its April 18, 2012 meeting, EPA staff suggested that no beyond-the-floor analysis was required because the flow indicator and car-seal requirements were provisions the Agency decided to put in place to address malfunctions. This argument is patently flawed and fails for two reasons. First, it is clear that the provisions are not intended to deal simply with malfunctions, but apply also to normal operations and maintenance activities:

> *Our intent in this final rule is that control devices will not be bypassed; therefore, use of the bypass at any time to divert a regulated vent stream to the atmosphere would be a deviation from the emissions standards. Additionally, due to the precedent set forth in the recent court vacatur of the exemptions to emissions standards for startup, shutdown, and malfunction [Sierra Club v. EPA, 551 F.3d 1019 (D.C. Cir. 2008)], we are required to ensure that section 112 emissions limitations are continuous and apply at all times. Thus, we are not adopting exemptions for maintenance activities and equipment such as pressure relief devices, low leg drains, high point bleeds, analyzer vents, and open-ended valves or lines as part of this action.*[65]

More importantly, the Agency's position—that the monitoring of equipment and reporting of equipment conditions are not emissions standards subject to beyond-the-floor analysis—is contrary to the plain language of the Clean Air Act. In this regard, Section 302 of the Clean Air Act defines "emission limitation" and "emission standard" to mean:

[62] *Portland Cement Ass'n*, 665 F.3d at 196 (D.C. Cir. 2011) (Williams, J., concurring).

[63] *Sierra Club v. EPA*, 353 F.3d 976, 989 (D.C. Cir. 2004).

[64] *Sierra Club v. EPA*, 167 F.3d 658, 666 (D.C. Cir. 1999).

[65] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 10-26.

> *...a requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including* ***any requirement relating to the operation or maintenance of a source to assure continuous emission reduction, and any design, equipment, work practice or operational standard promulgated under this chapter****.*[66]

Put simply, this broad language encompasses any requirement to install a flow indicator, key and lock, or car-seal. The Agency may believe that it can proceed pursuant to its alternative authority, under Section 114(1)(c), to require the installation and use of monitoring equipment. Such authority, however, would be limited to the installation of flow indicators, and would not cover emission limitation measures clearly intended to "limit[] the quantity, rate, or concentration of emissions of air pollutants on a continuous basis," such as car-seals and locks and keys. Moreover, the inclusion of flow indicators with the other two approaches raises significant questions as to whether flow indicators really are only intended for monitoring.

Given that PVC facilities are already prohibited from bypassing control devices (subject to equipment opening standards), and that nothing in the record indicates that a PVC facility currently uses car-seals or flow indicators, and that they are not required by the VCM NESHAP, this requirement constitutes a beyond-the-floor standard for which EPA should have considered costs and other factors. A review of the background documents for both the proposed and final PVC MACT rule indicates that the Agency performed no such analysis.

The Agency's treatment of the closed vent system bypass provision stands in stark contrast to its approach to pressure relief devices ("PRDs"). Although the Working Group found the Agency's PRD analysis to be fatally flawed, as discussed below, EPA at least conducted an analysis of the costs and benefits of its beyond-the-floor requirements for equipment leaks, including installation of PRD flow indicators.[67] EPA's approach for this analysis is instructive because of the obvious parallels with the bypass requirements. First, EPA determined that the MACT floor level of control for equipment leaks was compliance with the existing PVC NESHAP at 40 C.F.R. Part 61, Subpart V. Next, the Agency determined that the imposition of a requirement to comply with 40 C.F.R. Part 61 Subpart UU would be appropriate.[68] Like the bypass provisions, EPA did not specifically identify the requirement to equip PRDs with release indicators and an alert system as a beyond-the-floor requirement, even though Subpart V does not include requirements for flow monitoring for PRDs.[69] Nevertheless, EPA proceeded to analyze the costs and benefits of PRD flow indicators. The Agency's action is particularly compelling given prior decisions prohibiting the consideration of costs when setting the MACT

[66] 42 U.S.C. § 7602(k) (emphasis added).

[67] Docket Document No. EPA-HQ-OAR-2002-0037-0102, at 19-21, *Memorandum from Eastern Research Group, Inc. (ERG) to J. Howard, USEPA: Costs and Emission Reductions of the Proposed Standards for the Polyvinyl Chloride and Copolymers (PVC) Production Source Category*; *see also* Docket Document No. EPA-HQ-OAR-2002-0037-0194, at 27, *Memorandum from Eastern Research Group, Inc. (ERG) to J. Howard, USEPA: Revised Beyond-the-Floor Analysis for the Polyvinyl Chloride and Copolymers (PVC) Production Source Category*.

[68] 77 Fed. Reg. 22,896.

[69] *See* 40 C.F.R. § 61.242-4.

floor,[70] thus confirming that EPA viewed the PRD release indicator and alarm as a beyond-the-floor requirement.

The Agency's failure to develop an analysis of the flow indicator, lock and key and car-seal requirements for closed vent systems under the PVC MACT also is curious in light of the cost analysis it conducted for virtually identical requirements in the recently proposed Uniform Standards.[71] The Uniform Standards are regulatory templates that EPA intends to tailor to specific source categories and various process components and equipment in future rulemaking. Thus, EPA's performance of a cost analysis for the Uniform Standards confirms the applicability of a similar analysis to the PVC MACT; it confirms that the Agency's failure to do so was arbitrary and capricious.

The Working Group recognizes the difficulties EPA faced in grappling with how best to address malfunctions:

> *EPA has determined that CAA section 112 does not require that emissions that occur during periods of malfunction be factored into development of CAA section 112 standards. Accounting for malfunctions would be difficult, if not impossible, given the myriad different types of malfunctions that can occur and given the difficulties associated with predicting or accounting for the frequency, degree, and duration of various malfunctions that might occur. EPA's rationale for its approach to malfunctions is not based on the criteria that must be met to justify a work practice standard under CAA section 112(h). Further, setting work practice standards under section 112 presents the same issues as setting numerical emission limits given the varied nature of malfunctions.*[72]

The preceding discussion clearly explains why the Agency believes that it is unable to address malfunctions under the Act's emissions limitation framework. But the accounting difficulties associated with malfunctions do not grant EPA any extra-statutory authority. Ultimately, the Agency must work within the constraints of the Clean Air Act, which the EPA has violated by failing to provide sufficient rationale, including cost analysis, for its actions.

C. Installation of Flow Indicators, Car-Seals, or Locks and Keys to Prevent Bypasses is not Achievable and is Unnecessary

EPA is requiring that flow indicators, car-seals, or lock-and-key configurations be installed on bypasses in closed vent systems. Car-seals or lock-and-key configurations arguably would have the lowest per unit installation costs, but where these are used, EPA is requiring PVC facilities to:

> *...visually inspect the seal or closure mechanism at least once every month to verify that the valve is maintained in the non-diverting position, and the vent stream is not diverted through the bypass.* ***A broken seal or closure mechanism***

[70] *See, e.g., National Lime Association v. EPA*, 233 F.3d 625, 640 (D.C. Cir. 2000).

[71] 77 Fed. Reg. 17,898.

[72] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 3-2.

> ***or a diverted valve constitutes a violation*** ***from the emission limits in Table 1 or 2 to this subpart.***[73]

As a preliminary matter, the preceding language is unworkable because it is overbroad. Any time a car-seal is broken or a key turned, including after equipment opening requirements have been performed, would constitute a violation. Breaking the car-seal or diverting the lock-and-key mechanism should not constitute a violation when done in the course of routine maintenance or normal operations if the car-seal is replaced or the lock-and-key mechanism is returned to the non-diverting position after maintenance is completed.[74] We find it difficult to believe that the Agency actually intended this outcome, which could be interpreted by inspectors to constitute innumerable violations, which would be arbitrary and capricious. Therefore, EPA should reconsider and revise the final rule in order to allow for normal operations and maintenance activities.

In addition, the Working Group believes that EPA has not fully grasped the scope and burden of these requirements. Given the lack of an Agency analysis on the PVC MACT car-seal requirements, the Working Group turned to the recently proposed Uniform Standards for closed vents systems for a sense of EPA's possible approach to the PVC MACT requirements. For the car-seal or lock-and-key requirement, EPA based its estimate on the use of a key lock and chain at a per unit cost of $97. Taking into consideration sales tax, shipping and installation, the cost ballooned to $154 per unit.[75] We note that certain types of valves commonly in use at PVC and other chemical facilities cannot be car-sealed or secured with a lock and key and would need to be replaced at significantly greater expense. EPA did not consider such a cost contingency in its Uniform Standards analysis, and obviously not for the PVC MACT.

EPA's estimate that total monitoring, recordkeeping, and reporting costs associated with the monthly car-seal inspection requirement would be approximately $113 per year has no basis in reality.[76] The Agency's estimate is based on an assumption that monthly car-seal inspections would take approximately 10 minutes of operator time per month. Considering that affected sources must certify compliance, the 3 min/year of Engineering review and 3 min/year of Managerial (*i.e.*, Responsible Official) review estimated by EPA is grossly underestimated. Either the Agency believes that this annual cost is a per car-seal estimate, or the Agency does not mean what the plain language of the rule says about the scope and extent of equipment covered by the bypass prohibition. In either event, the rule is based on material error in that the cost estimate is hideously low, or as illustrated by **Figure 3**, the language is not what the Agency intended.

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[73] 77 Fed. Reg. 22,916, to be codified at § 63.11930(c)(2)(i) (emphasis added).

[74] This may not have been the Agency's intent, but if so, no language or provision of the final rule makes this clear.

[75] Docket Document No. EPA-HQ-OAR-2010-0868-0002, at B-18, *Development of Monitoring Cost Estimates for the Proposed Part 65 Uniform Standards for Control Devices – Subpart M, Document*.

[76] *Id.* at 10.

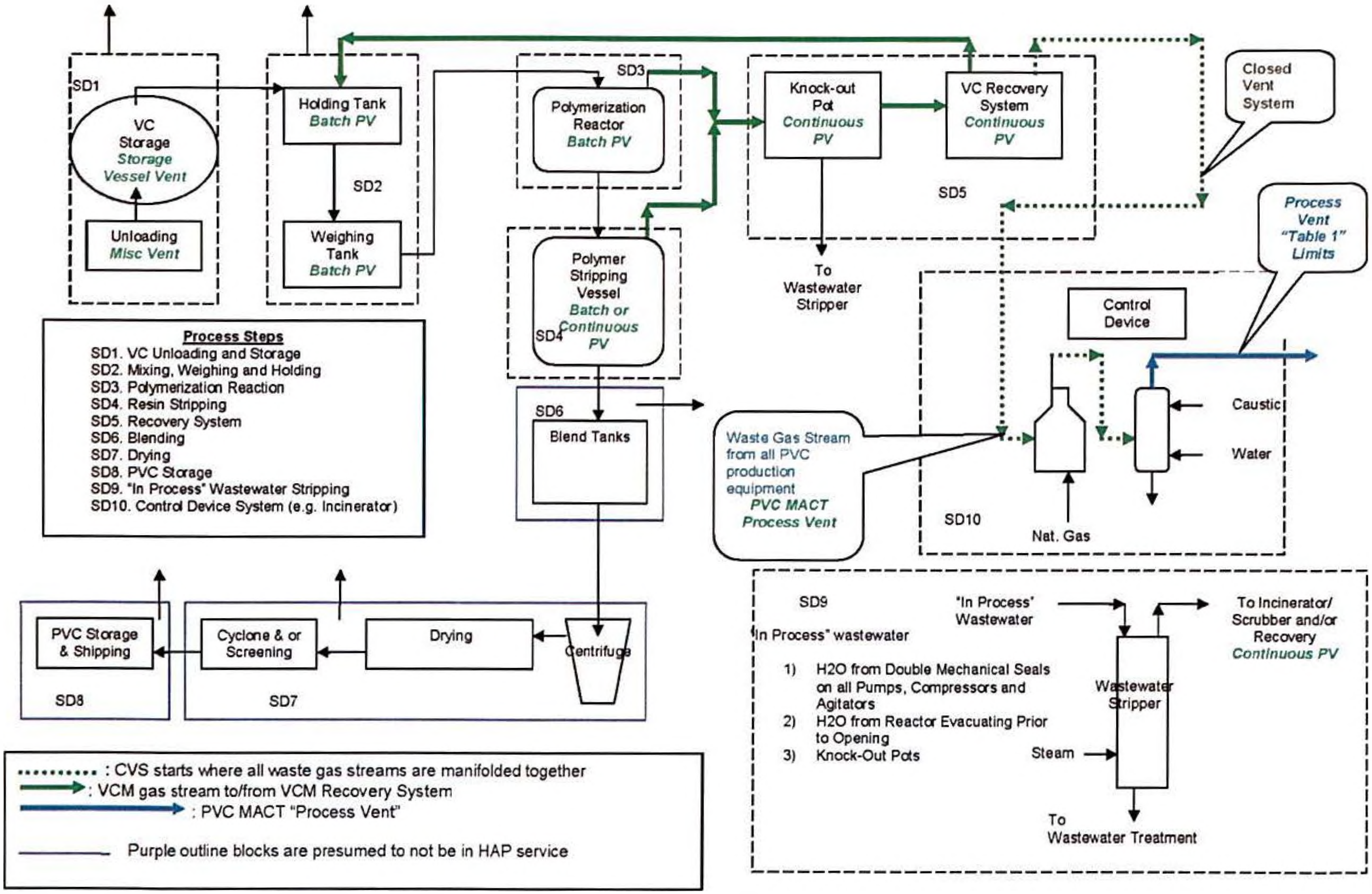

Figure 3: Suspension and Dispersion Processes Flow Diagram: Process Vents

The problem with EPA's cost estimation and by extension, its approach to bypasses at PVC facilities is the sheer number and types of components covered by the bypass prohibition. As **Figure 3** indicates, whether the closed vent system begins at discrete emission points, after the recovery device, or somewhere in between, determines whether facilities must monitor and inspect thousands, hundreds, or a few score valves under the bypass provisions. Moreover, the procedures for complying with the car-seal inspection, recordkeeping, and reporting procedures are significantly more complicated than simply looking to see if a car-seal is in place.

Vent valves are located at the top of structures for high point bleeds, in the middle of pipe racks normally not accessible but needed for high or low points of expansion loops, between block valves used to isolate equipment, and many other difficult to reach locations. These valves, which may be opened during routine maintenance to support batch operations, are all subject to equipment opening procedures before being accessed. They also are critical to the safe and proper operation of the facility, and thus are already subject to a painstaking inspection process that EPA has woefully underestimated.

Working Group members have reviewed the PVC MACT rule and developed an analysis of initial and monthly compliance with the car-seal inspection requirement, including mandatory training to ensure safe operation. The analysis, which is enclosed as **Exhibit VII**, assumes, conservatively, that a PVC facility with 350 valves and components uses car-seals as the lowest cost alternative to meeting the requirements. Working Group members also assumed that the facility has four reactors with four valves or other components that must be opened on a daily basis. As a result, the Working Group estimates that each PVC facility will incur $29,184 initially, and $763,541 annually thereafter, or approximately $2,192 per valve or component subject to the car-seal requirements. These are costs in search of benefits where none can be found.

In addition, **Table 5** below clearly illustrates the level of confusion already in place within the PVC industry over the scope and extent of the Agency's bypass provisions. For example, the facilities reporting the highest numbers of potential bypass points assumed the following should be counted:

- All valves in HAP vapor service;
- 1/3 of the valves in HAP liquid service (it was assumed that there is one liquid leg drain valve for every two block valves in the line);
- All relief devices in HAP vapor service;
- All connectors in HAP vapor service; and
- All pumps, compressors, and agitators.

Whereas, facilities reporting a lower number of bypass points based their estimate on the number of valves in vinyl chloride service that are covered by their LDAR program, or started counting valves after the recovery device. It is impossible to determine from the plain language of the final rule or the Agency's background documents which approach is the correct one.

Table 5: Bypass Vents, Valves, and Other Components

Facility	No. of Valves	Bypasses[‡]
Dow Midland	150	0
Formosa Baton Rouge	50	0
Formosa Delaware	235	0
Formosa Point Comfort[*]	350	0
Formosa SPVC	400	0
OxyVinyls Deer Park	3,576	0
OxyVinyls Pasadena	6,600	1
OxyVinyls Pedricktown[b]	141	0
	53	
PolyOne Henry	167	0
PolyOne Pedricktown	167	0
Shintech Addis	258	0
Shintech Freeport	1128	0
Shintech Plaquemine	167	0
Westlake Calvert City	202	0
Westlake Geismar	369	0
Georgia Gulf Aberdeen	711	0
Georgia Gulf Plaquemine	550	3
TOTAL	**15,124**	**4**

Notes:
[‡] All bypasses were reported to the National Response Center ("NRC").
[*] Related to a power loss at the facility.
[a] Valves on closed vent system, including recovery device=350; line from recovery system to thermal oxidizer=40.
[b] Bleeds and process safety valves=141; Block valves to pressure indicators and transmitter = 53.

It is also worth noting that EPA's approach to bypasses is not comprehensive. Flow indicators, which cost prohibitively more than car-seals or key-locks,[77] merely detect and identify that a bypass has occurred, and cannot prevent a bypass. Conversely, car-seals and key-locks are intended to prevent the diversion of a vent stream, but cannot detect, prevent, or identify a bypass should one inadvertently occur or result from intentional maintenance activities. Nor has EPA demonstrated a need for such burdensome requirements, particularly given the regularity with which certain valves and other components must be opened during normal operations. As **Table 5** indicates, there have been **only four bypasses from PVC facilities over the past five years**.

D. EPA Failed to Consider Equipment and Procedures Currently in Place to Address Bypasses

EPA acted arbitrarily and capriciously when it refused to consider the effectiveness of systems currently in place at PVC facilities to monitor and notify operators about the occurrence and locations of bypasses. All PVC facilities are required to have an extensive ambient air area monitoring system that ensures that vinyl chloride releases are detected expeditiously.[78] As EPA has recognized elsewhere, vinyl chloride is the best substance for this purpose because of its prevalence throughout the process.[79]

[77] *Id.* at 6 (Table 5). In its Uniform Standards rulemaking, the Agency assumed the cost to be one-half of the purchased equipment cost of the gas phase flow meter, or $900, with a total capital investment of $3,150 and a total annualized cost of $3,300.

[78] 40 C.F.R. § 61.65(b)(8)(i).

[79] 77 Fed. Reg. 22,885, *supra* text at note 49.

A typical ambient air area monitoring system at a PVC facility will use two or more gas chromatographs or mass spectrometers connected to multiple emission detection points set at various locations throughout the facility. These points are connected by sample tubes back to each monitor, which in turn analyzes the sampled stream and transmits the readings in real-time to a control room. The monitors cannot read all the emission points simultaneously and thus will cycle from point to point. The amount of time it takes the monitor to cycle through all of its assigned points once is the "Analysis Cycle Time," and represents the longest amount of time it will take for the system to detect a release at the action level.

Table 6: Ambient Area Air Monitoring Systems

Company & Facility	No. of Monitors and Type	No. of Points	Action Level (potential leak)	Analysis Cycle Time
Dow Midland	2 GCs	30	1 ppm for personnel areas, 5 ppm for processing areas	10-20 min.
Formosa Baton Rouge	2 GCs	41	5 ppm VCM or greater	20 min.
Formosa Delaware	4 GCs	46	1 ppm VCM or greater	20 min.
Formosa Point Comfort	2 Mass Spec	96	5 ppm VCM or greater	30 min.
Formosa SPVC	2 Mass Spec	109	5 ppm VCM or greater	18 min.
OxyVinyls Deer Park	1 Mass Spec	33	5 ppm or > 4x @ 1 ppm	16.5 min.
OxyVinyls Pasadena	6 GCs	120	5 ppm or > 4x @ 1 ppm	15 min.
OxyVinyls Pedricktown	3 GCs	42	5 ppm or > 4x @ 1 ppm	12-15 min.
PolyOne Henry	2 Mass Spec	38	> 1 ppm VCM or greater	6 min.
PolyOne Pedricktown	2 GCs	20	> 1 ppm VCM or greater	10 min.
Shintech Addis	7 GCs	101	5 ppm	7.5 min.
Shintech Freeport	15 GCs	216	5 ppm	7.5 min.
Shintech Plaquemine	7 GCs	101	5 ppm	7.5 min.
Westlake Calvert City	6 GCs	57	3 consecutive readings from the same point at > 10 ppm VCM	10 min.
Westlake Geismar	2 GCs	40	> 1 ppm for personnel areas, > 5 ppm for process areas	30 min.
Georgia Gulf Aberdeen	5 GCs	50	5 ppm	10 min.
Georgia Gulf Plaquemine	3 GCs	43	5 ppm	22.5 min.

The action level ranges from 1 ppm to 10 ppm vinyl chloride, and is a function of the number of points, size of the facility, and the sensitivity of the equipment. The system automatically triggers an alarm in the control room once it detects any vinyl chloride above the action level. The control room monitor provides information on the concentration of vinyl chloride, the general location of the detection point, date, and time. PVC facilities use various methods to pinpoint releases detected by their ambient air area monitoring systems. Some facilities have alarm lights near the detection point that begin to flash as an aid for personnel looking for the release or leak. Others use audio, visual, or olfactory ("AVO") detectors to pinpoint the source of the alarm. Still others use hand-held devices near the detection point to identify the source of a leak or release.

Detection points are located at high and low locations around the facility. Thus, it is unlikely that the ambient air area monitoring systems would fail to detect any bypass. Yet, EPA insists that flow indicators, car-seals, or key and locks be installed to ensure that bypasses do not occur at PVC facilities,[80] or if they do, that they are identified and addressed immediately. It is not possible to verify this assumption from the administrative record, however, because (1) EPA did not perform the analysis; and (2) the Agency did not consider the effectiveness of existing

[80] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 10-25 to 10-26.

practices at PVC facilities that are intended to prevent bypasses or detect them within minutes. Accordingly, the Agency has failed to demonstrate in accordance with the Clean Air Act that these beyond-the-floor requirements are achievable, and reconsideration of these measures is warranted.

VI. Pressure Relief Device Requirements are not Achievable and Must be Reconsidered

As with the bypass provisions, EPA had no basis for finding that certain requirements applicable to PRDs are achievable in accordance with the Act. Under the PVC MACT, PRDs that discharge directly to the atmosphere must be equipped with release indicators and an alert system that will notify an operator immediately and automatically when the pressure relief device is open.[81] EPA estimated that each facility would incur capital costs of $188,900 and annual costs of $26,900 to implement this requirement, based on a heavily discounted per PRD cost of $1,410.[82] According to EPA, the release indicators are necessary because:

> *Release events from PRD have the potential to emit large quantities of HAP, and a large number of these releases that may occur may not be identified and controlled in a timely manner, and may be due to repeat problems that have not been corrected. In the final rule, PRD are required to be equipped with indicators to identify and record the time and duration of each pressure release. The requirement to install indicators to identify and record the time and duration of each pressure release is a compliance requirement to ensure the PRD requirements in the final rule are met. They help ensure that any PRD discharge, i.e., a release of uncontrolled HAP emissions, is immediately known to the source operator and recorded for future consideration by the facility or regulatory authority, so that remedial or preventative action can be taken to minimize or avoid PRD discharges in the future.*[83]

During the comment period, the Working Group demonstrated that release indicators were unnecessary for PRDs because multiple systems and procedures already are in place at PVC facilities to perform the function of identification and operator notification. Some of these include extensive electronic monitoring of process and equipment pressures with multi-stage alarms (high and high-high) continuously monitored by operators located in control rooms, operators working in the process areas with the ability to both visually and audibly detect PRD operation, and VCM monitoring systems designed to detect releases and the area of the plant in which they are located.

> *We acknowledge, based on information from the commenters, that the PVC industry typically installs area monitors in addition to rupture discs in series with relief valves. We also acknowledge other commenters' statements that multiple systems and procedures exist to detect and remedy releases from PRD, although they did not identify specific systems or procedures for the EPA to consider. However, the commenters did not suggest that the EPA adopt any type of*

[81] 40 C.F.R. § 63.11915(c)(1).

[82] 77 Fed. Reg. 22,893.

[83] 77 Fed. Reg. 22,882 (emphasis added).

> *monitoring or recordkeeping requirement for PRD discharges, and commenters' statements taken as a whole do not support a conclusion that all PVC facilities currently install and use effective means to detect and record PRD discharges for all of their PRD.*[84]

The preceding statements illustrate the errors in the Agency's PRD approach. EPA may not propose and dispose on the basis of vague concerns, while holding industry to a more stringent standard in refutation. In promulgating its regulations, EPA is required to examine and take a "hard look" at the available data to ensure that a "rational connection" exists between the facts and the regulatory solution chosen by the Agency.[85] **EPA did not ask for, nor did it receive, PRD information from industry, because it specifically instructed in the Section 114 Survey, Form K-1-b, that industry not include any pressure relief data**.[86] Nor does it appear that EPA examined the data from any other source concerning the extent, frequency, and length of PRD releases for its own decisionmaking. It goes without saying that EPA did not provide such data to the public for review and comment on the relevance and adequacy of such data as the basis for informed and reasoned rulemaking. Yet EPA requires the PVC industry, which reasonably should need only point the Agency to its own records, to do more. This is the essence of arbitrary and capricious rulemaking.

Second, the data clearly shows that the Agency's concerns over PRD releases from the PVC industry are unfounded. The release indicator requirement is a solution in search of a problem. Even assuming that enhanced notification of PRD releases is warranted, nothing in the record suggests that release indicators will perform this function more effectively than the systems and procedures currently in use at PVC facilities. Indeed, EPA acknowledged that the requirement would provide zero net environmental benefit.[87] Accordingly, the Agency has failed to demonstrate that the installation of PRD release indicators, taking into consideration cost and other factors, is achievable, and must reconsider this requirement.

A. PRD Releases From the PVC Industry are Infrequent, of Short Duration, and Release Minimal Amounts of HAP

The PVC industry did not suggest that EPA adopt any reporting or recordkeeping requirements concerning PRD discharges because the Working Group pointed to such existing requirements in its comments on the proposed rule. Specifically, the Working Group noted that vinyl chloride releases are subject to a one-pound reportable quantity ("RQ") under the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") and Emergency Planning and Community Right-to-Know Act ("EPCRA") regulations.[88] Given this

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[84] 77 Fed. Reg. 22,881.

[85] *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43 (1983); *Small Ref. Lead Phase-Down Task Force v. EPA*, 705 F.2d 506, 520, 531 (D.C. Cir. 1983).

[86] Indeed, in Form F of the survey, EPA requested information on all process startup, shutdown, and malfunctions, and specificed that emergency/safety relief events are not considered malfunctions.

[87] Docket Document No. EPA-HQ-OAR-2002-0037-0195, at 17, *Memorandum from Eastern Research Group to Jodi Howard, EPA, Subject: Revised Costs and Emission Reductions for Major Sources in the Polyvinyl Chloride and Copolymers (PVC) Production Source Category*.

[88] Docket Document No. EPA-HQ-OAR-2010-0868-0146, at 99; *see also* 40 C.F.R. § 302.4; 40 C.F.R. § 372.65.

low threshold and the pressures typically involved in PRD releases, the procedure at PVC facilities is to report **any** PRD release of VCM to the National Response Center operated by the U.S. Coast Guard as a release, and to provide a correction should the amount of the release prove to be below the threshold. Details of the release also must be reported within 10 days to the EPA Administrator.[89] These reports on incidents also are reported in the quarterly compliance report to the Agency. Accordingly, EPA has a comprehensive database of information with which to assess the extent and scope of PRD releases within the industry.

Nowhere in the docket, however, does the Agency review or summarize PRD releases by the PVC industry, assess the quantity of HAPs released, or review current industry measures to address these releases. The Working Group made this very point at its June 30, 2011 meeting with EPA. We pointed out that given the additional data collection on other matters, there simply was not enough time to collect and aggregate this information before the close of the comment period, but that it was readily accessible by EPA from its own records. Agency staff demurred, suggesting that there was widespread non-compliance with the PRD release prohibition and the reporting requirements within the PVC industry.

As indicated above, members of the PVC industry have long been required by law to provide timely and accurate reports of PRD releases under both the VCM NESHAP and CERCLA. Failure to do so is a significant offence subject to serious consequences including possible criminal prosecution. In addition, the Agency has several investigative and analytical tools at its disposal, specifically the Section 114 Request, which it could have used to better understand this issue, but chose not to. The Agency also could have laid out its non-compliance concerns in the preamble to the proposed rule, and requested data either supporting or contradicting the view that PRD releases are widespread. It did neither and simply decided, without reasoned analysis, that release indicators are needed to identify otherwise supposedly unknown releases.

The industry has since been able to collect preliminary information spanning the past three years from 17 Working Group member facilities. The data, which is summarized at **Table 7**, includes the number of PRDs at each facility, the total number of releases over the past three years, and the number of releases reported to the National Response Center ("NRC").

Table 7: Pressure Relief Devices and Releases Reported Over the Past Three years

Company & Facility	Number of PRDs	Number of Releases (last 3 years)	Number of Releases Reported to NRC
Dow Midland	112	0	0
Formosa Baton Rouge	175	0	0
Formosa Delaware	39	0	0
Formosa Point Comfort	92	0	0
Formosa SPVC	95	1	1
OxyVinyls Deer Park	72	0	0
OxyVinyls Pasadena	426	0	0
OxyVinyls Pedricktown	39	0	0
PolyOne Henry	125	1	1
PolyOne Pedricktown	127	0	0
Shintech Addis	91	0	0
Shintech Freeport	256	0	0
Shintech Plaquemine	57	0	0

[89] 40 C.F.R. § 61.65(a).

Table 7: Pressure Relief Devices and Releases Reported Over the Past Three years			
Company & Facility	Number of PRDs	Number of Releases (last 3 years)	Number of Releases Reported to NRC
Westlake Calvert City	130	0	0
Westlake Geismar	50	0	0
Georgia Gulf Aberdeen	109	3	3
Georgia Gulf Plaquemine	139	9	9
TOTALS	2134	14	14

There are over 2,134 PRDs in service at these 17 Working Group member facilities. Clearly, PRD releases from PVC facilities to the atmosphere are demonstrably infrequent. There have been only 14 releases from a total of 2,134 PRDs in the past three years. All releases were reported to the NRC and to EPA, regardless of whether the releases exceed the one-pound RQ.

Based on current performance, additional PRD regulation is not justified.

B. All PVC Facilities Have Installed and use Effective Means to Promptly Detect and Record PRD Discharges for all of Their PRDs

It should not be surprising that there are very few releases across the industry. PRDs are a last line of defense to bring a high pressure situation under control after a multi-layered system of primary, secondary, and even tertiary monitoring and alarms, coupled with response components and processes has failed. These processes include emergency polymerization termination agents, emergency cooling systems, back-up power generation, and venting to control systems. At each of these steps, there are indicators and high pressure alarms to notify the facility operator immediately.

Every polymerization reactor is equipped with pressure transmitters that continuously monitor reactor pressure and alarm at preset high pressure and high-high pressure points designed to allow for multiple corrective actions before any release to a pressure relief device could occur. These alarms must be addressed as they typically indicate a process or equipment issue that must be resolved expeditiously in order to maintain normal operating condition parameters essential to producing within-specification products. Because PRDs can only lift at the pressure trigger, the PRD cannot activate if all operating parameters are in nominal ranges. Computer monitoring of pressure trends is performed continuously so that even before a high-pressure alarm, the operator is aware of changing pressure conditions. Some reactors are equipped with hydroful pressure relief tanks to relieve any hydroful situations to prevent a release.

First and foremost, it is in every operator's interest to monitor the polymerization process in order to prevent a run-away reaction that can have catastrophic consequences for people and property. When the intervention measures discussed above are not sufficient, the temporary lifting of a PRD to relieve pressure provides an overwhelmingly useful mitigation tool with minimal consequences, from a safety standpoint. Yet even a brief lift with minor emissions is highly undesirable because it likely will result in a costly off-spec product batch.

According to preliminary information collected from Working Group members, unless safety considerations required a delay, facility personnel generally detected, identified, and responded to PRD releases within one to 15 minutes. The rapidity of the response also ensures that the quantity of HAPs released to the atmosphere is limited. Most significantly, PRDs are designed to automatically close – thus stopping the release – as soon as the reactor pressure has subsided. EPA's new requirement for release indicators and alert systems will do absolutely nothing to enhance, nor accelerate, the effectiveness of this existing protective measure.

Every PVC facility is required to have in place a plan for programmed maintenance of every relief valve in accordance with the CAA § 112(r) risk management plan requirements and the Occupational Safety and Health Act process safety management regulations at 29 C.F.R. § 1910.119. For example, relief valves at PolyOne's Pedricktown facility are changed out and rebuilt every five years. Many valves that are in contact with multi-phased material, *e.g.*, liquids, gases, and solids, have a rupture disk beneath the PRD. All rupture disks ("RD") are on some type of change out frequency depending on service. The frequency ranges from every six months to two years depending on the vessel. For example, at the PolyOne Henry plant, PRDs in vinyl service are tested annually if there is no RD below the PRD, and every two years if a RD is present. The PRDs are rebuilt if mechanical testing indicates that the PRD either will not operate at the set pressure trigger, or operates too soon. Both PolyOne plants rebuild or replace any PRD that lifted due to an over pressure incident.

In addition to the multi-layer parametric and detection and warning systems discussed above, all PVC facilities utilize their ambient air area monitoring system, as described in section V.D., to ensure that vinyl chloride releases are detected expeditiously. Vinyl chloride is the best substance for this purpose because of its prevalence throughout the process.

The agency has not identified any inadequacies in the existing, redundant system of monitoring and alarms to prevent PRDs. Indeed, actual event data during years of operation validates the adequacy of current controls.

C. *EPA's Release Indicators Provide no Added Benefit to Current Industry Release Detection Methods at a Burdensome Cost*

During the comment period, the Working Group noted that EPA's cost estimates for installation of PRD release indicators were significantly lower than is likely, and provided estimates demonstrating that the actual capital costs would exceed $1,000,000 per facility. EPA, however, did not find these estimates to be sufficiently detailed and instead used data developed by the South Coast Air Quality Management District ("SCAQMD").[90] One fundamental error in EPA's approach, however, was its use of the so-called "Six-Tenths Rule" to account for economies of scale.

EPA used a base cost of $10,000 per PRD to install wireless monitoring, which is equivalent to the high end of the cost range provided by the SCAQMD.[91] The SCAQMD analysis, which did not use the Six-Tenths Rule in its cost estimate, noted that "[d]ata provided by wireless industry representatives and a refinery that has installed ten electronic monitoring

[90] *Id.*

[91] Docket Document No. EPA-HQ-OAR-2002-0037-0195, and associated calculation spreadsheet, Docket Document No. EPA-HQ-OAR-2002-0037-0199.

devices has indicated that the unit device cost ranged from $5,000 to $10,000 which includes device parts, installation and maintenance."[92] In addition, the SCAQMD staff determined that the total cost to purchase and install electronic monitoring devices for 657 PRDs (565 in gas/vapor service – 10 already installed by one facility + 102 in liquid service) was estimated to range from $3.3 million to $6.6 million. Annual operating costs were deemed to be minimal because they included periodic replacement of inexpensive batteries.

Based on a review of actual quotations for PRD monitoring systems, the Working Group does not object to the SCAQMD estimate of $5,000 to $10,000 per indicator. Our preliminary research indicates that the per PRD cost will depend on the system's capabilities, and at least one member's detailed assessment suggests that the per PRD figure is significantly higher. Nevertheless, it is clear that EPA's application of the Six-Tenths Rule was unreasonable. Assuming that a single PRD monitor at a PVC facility would cost $10,000, the Agency adjusted that amount to account for economies of scale or volume discounts. Since the model PVC facility used for the cost estimate would need 134 PRD release indicators, EPA, instead of applying some reasonable percent discount to $1,340,000 (the cost of 134 PRD monitors at $10,000 each), incorrectly applied the Six-Tenths Rule to determine the volume discount.

The Six-Tenths Rule is meant to characterize the relationship between the cost and the size of a manufacturing facility. As size increases, cost increases by an exponent of six-tenths. This rule is typically applied when scaling equipment costs.[93] For example, if we know that the cost of a piece of equipment is $10,000 for size X, we can use the Six-Tenths Rule to scale the cost of that piece of equipment to size Y. The Six-Tenths Rule reasonably would apply to PRD release indicators if it was known that a particular size of indicator cost $10,000 and a model facility needed to scale the cost to a different size of indicator. It is not appropriate, however, to scale the cost of one indicator to determine the per unit cost of 134 indicators.

Using the Six-Tenths Rule in this incorrect manner, EPA concluded that PRD indicators at PVC facilities would cost $1,410, or an 86% discount from the $10,000 unit price for each PRD.[94] No significant leap or analysis is required to recognize and understand that an 86% discount is beyond optimistic; it is unrealistic. Indeed, the SCAQMD did not apply any discounting factor to its estimate,[95] so it is unclear why EPA chose to, nor does the Agency provide a reasoned or reasonable analysis for this assumption.

The SCAQMD analysis is instructive for another reason. The SCAQMD determined that based on a cost per indicator of $5,000 to $10,000 per device, the cost of installing 657 PRDs was $3.3 million to $6.6 million. As a check on the South Coast estimate, Working Group

[92] South Coast Air Quality Management District, "*Final Staff Report For Proposed Amended Rule 1173 - Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants*," May 15, 2007.

[93] *See* EPA, Economic Impact Analysis (EIA): Small Municipal Waste Combustors-Emissions Guidelines and New Source Performance Standards, p. 10 EPA-452/R-00-001 (May 2000).

[94] *See, e.g.*, spreadsheet included in Docket Document No. EPA-HQ-OAR-2002-0037-0199, Tab: *PRD Wireless Monitoring*, Cell: C5.

[95] South Coast *supra* note 92, at 6-4.

members sought out their own cost estimate for wireless PRD pressure transmitters. The model plant was Westlake's Geismar, LA facility which has 50 PRDs.

Westlake estimates the cost for piping modifications to the annular space between the rupture disk and the PRD and to install each transmitter to be approximately $2,000, and when applied to 50 PRDs, the installation cost is projected to amount to $100,000. Westlake received quotes for 50 wireless pressure transmitters and power supplies, two wireless device managers, and two wireless field access devices from Honeywell that totals $175,384, which is included as **Exhibit VIIIa**. In addition, Westlake received a cost estimate from Champion Technology Services for $6,800 for Honeywell's OPT Tunneler software and programming to tie the transmitted signal into the control room, which is included as **Exhibit VIIIb**. The total cost for the installation at Westlake Geismar's facility would be $100,000 + $175,384 + $6,800 = $282,184, a cost per PRD of $5,643.

In short, the Westlake test case indicates that EPA underestimated the real world cost of complying with the PRD requirement by close to a factor of four. It is important to note that the transmitters used for the Westlake estimate are less expensive, but arguably less accurate than lift indicators. Specifically, EPA is requiring facilities to install "a release indicator on each PRD that would be able to identify and record the time and duration of each pressure release and notify operators that a pressure release has occurred."[96] The pressure transmitters evaluated by Westlake measure the pressure in the annular space between the rupture disc and the relief valve. Theoretically, a facility should be able to determine when a release occurs and when it stops, solely by measuring the annular space pressure. Lift indicators, in contrast, measure the displacement of the stem on the seat of the valve, and are an accurate recording of the time and duration of any movement of the valve seat itself. The Working Group assumed that pressure transmitters would be an acceptable alternative to lift indicators as not every relief valve can be fitted with one. To do so would be a very expensive undertaking that would require the industry to replace or retrofit the valves to incorporate the lift indicator technology. If this was EPA's intent, then the actual costs to comply with the Agency's requirement are likely significantly higher than the Westlake test case.

In addition, some Working Group members have expressed concerns about the viability of wireless technology in certain applications. For example, the use of a battery to power the transmitters adds additional maintenance costs and complexity, particularly in areas where safety considerations are paramount. There also continue to be concerns about the proprietary nature and lack of interchangeability of many of the systems currently on the market. Constantly changing and upgrading standards also present a problem particularly with regards to replacement and spare components. In addition, the well-documented security issues associated with wireless technology, as well as the possibility that wireless transmissions may interfere with other sensitive instruments, means that wired systems may be the only option for certain facilities. As the spreadsheets at **Exhibit VIIIc** indicate, the cost for a hard-wired system can be significantly more expensive, ranging from $19,000 per PRD for a system that did not require an additional junction box, to $35,000 per PRD for a system with an additional junction box.

[96] 77 Fed. Reg. 22,860.

As the requirement to install PRD release indicators over current detection and notification systems in use in the PVC industry is a beyond-the-floor requirement, EPA is required to take "into consideration the cost of achieving such emission reduction." The Agency has itself recognized that this requirement will result in no emission reductions,[97] and the Working Group has already established that existing systems and procedures in place to prevent the releases (*e.g.*, short stop addition to reactors) for some vessels and for the remaining PRDs are able to provide near real-time detection and notification. Accordingly, the Agency has failed to demonstrate that the requirement is necessary or achievable, taking costs and other factors into consideration as required by the Act.

VII. EPA Should Reconsider and Allow Leak Detection and Repair of Pressure Vessels

Under Section 63.11910(c) of the final PVC MACT, pressure vessels must be operated as a closed system that does not vent to the atmosphere. In addition, potential leak interfaces on pressure vessels must be monitored annually for leaks using the LDAR procedures specified in Section 63.11915.[98] The problem here is that Section 63.11910(c)(4) makes any discharge from a pressure vessel *closure device* to the atmosphere a violation of the PVC MACT, without first providing an opportunity to fix the leak. During the rulemaking, the Working Group requested that, like other equipment, pressure vessels should be covered by all the LDAR provisions, including the ability to delay repair, such that these leaks are not automatic violations. According to EPA, however:

> *Since pressure vessels are defined to not vent to the atmosphere, this inherently makes them different from other storage vessels, such as fixed roof storage vessels that are designed to vent with diurnal temperature changes. We believe that because pressure vessels are designed to not vent to the atmosphere and with no detectable emissions, a leak (i.e., above 500 ppm background) from one would be inconsistent with the definition of a pressure vessel, and hence a violation of the rule.*[99]

Pursuant to Section 63.11890(d), leaks from pressure vessel closure devices are categorized as "deviations," not "malfunctions." Malfunctions are defined in part as "any sudden, infrequent, and not reasonably preventable failure…of process equipment."[100] EPA appears to be taking the position that leaks from closure devices are preventable, and thus may not benefit from the affirmative defense provision of the rule, but nowhere in the record does the Agency explain why or expand on the basis for these requirements. At the April 18, 2012 meeting with industry, EPA staff indicated that no repair option was set as the floor because the Agency had no data demonstrating that leaks do occur on pressure vessel interfaces, or that the industry was dealing with such leaks pursuant to one of the Agency's prescribed LDAR programs.

[97] Docket Document No. EPA-HQ-OAR-2002-0037-0195, at 17.

[98] 40 C.F.R. § 63.11910(c)(3).

[99] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 12-61.

[100] 40 C.F.R. § 63.2.

A. LDAR is the Common Approach for Dealing With Leaks From Pressure Vessels

Based on the plain language of the final PVC MACT rule, it would appear that EPA differentiates between leaks from closure devices and other potential "leak interfaces." EPA does not define "leak interface" in the final rule, but rather points to paragraph 8.3 of Method 21 at 40 C.F.R. Part 60, appendix A-7. As EPA notes, a potential leak interface is "a location where organic vapor leakage could occur,"[101] and Method 21 identifies several such sources, but only leaks from closure devices have been deemed a deviation at 63.11890(d) and a violation at 63.11910 (c)(4) by EPA under the PVC MACT. We note that welds, pressure vessel surfaces, and other components on pressure vessels can also leak. The Working Group assumes that leaks from such locations can be dealt with through the LDAR program, but the Agency has not defined what constitutes a "closure device," and nowhere does the regulatory text or any of the background documents state so expressly.

Perhaps EPA believes that closure devices present the highest likelihood of a leak because they are vulnerable to improper operation or operator error. Or, the Agency may have data on hand from other industries indicating that closure devices are the greatest source of leaks from pressure vessels. Another possibility is that lacking any information on closure device-related leaks, the Agency conducted a risk assessment and determined that they present the highest risk of a leak. The problem is that nothing in the rule or the rulemaking record provides any information on why EPA singles out closure devices or the concern the Agency has with these devices to warrant such special focus. Accordingly, it is not possible to determine whether the Agency's approach is reasonable or comports with the requirements of the Act.

EPA's approach to pressure vessels currently creates a regulatory conundrum. The final PVC MACT rule does not define the term "closure device," but the term has been defined in the Part 63, subpart DD regulations to include valves and other fittings.[102] Critically, valves also are included in the definition of "equipment," and thus, the industry clearly has an opportunity to repair leaks from valves under the final PVC MACT's LDAR provisions before a violation ensues.[103] The effectiveness and fundamental performance characteristics of a valve are the same whether used on a pressure vessel or elsewhere. Thus, either EPA intends to allow the repair of leaks from all valves at PVC facilities, but not hatches or lids, or the Agency has arbitrarily and incomprehensibly chosen pressure vessel closure devices as the dividing line between what constitutes a repairable leak and a violation. Indeed, based on the Working Group's long experience with pressure vessels, and as discussed in the next section, not only do closure devices and other components of pressure vessels leak under normal operating conditions, they can present significantly greater logistical issues to repair, which warrant use of LDAR procedures.

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[101] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 12-63.

[102] *See* 40 C.F.R. § 63.681. The Working Group notes that, as a general matter, each MACT standard should stand on its own, and constant cross-referencing to other, non-applicable MACTs for critical definitions, only complicates the task of compliance.

[103] 77 Fed. Reg. 22,911 (codified at 40 C.F.R. § 63.11915).

B. Using LDAR on Pressure Vessel Leaks is the Only Achievable Approach

Section 112(h) of the Act provides that "if it is not feasible in the judgment of the Administrator to prescribe or enforce an emission standard . . . the Administrator may, in lieu thereof, promulgate a design, equipment, work practice, or operational standard."[104] The Agency must first make a determination that HAPs "cannot be emitted through a conveyance designed and constructed to emit or capture such pollutant, or that any requirement for, or use of, such a conveyance would be inconsistent with any Federal, State or local law." The Working Group submits that fugitive leaks from pressure vessels such as spheres are specifically the types of emissions that cannot be routed to a control device and should be subjected to the LDAR provisions.

This principle applies equally to leaks from closure devices as from other potential leak interfaces. The primary consideration is that given the size of a pressure vessel, and other considerations, such as internal pressure, and emptying and clearing the vessel, it may not be possible to immediately stop a leak from a closure device without emptying the vessel—a process which can take several days. For example, typical spheres at PVC facilities range from 5,000 to 10,000 barrels in capacity, and generally take approximately three to four weeks to evacuate before personnel can safely enter and affect repairs.

A case in point involved a leaking flange from a 225,000-gallon vessel with a 24" manway on top of the vessel. The manway flange is included in the facility's LDAR program and monitored on a quarterly basis. On April 19, 2010, a 525 ppm leak was detected at the flange of the sphere manway. A first attempt to stop the leak was attempted by tightening the flange bolts, but this actually made the leak worse, resulting in an increased reading of 639 ppm. A second attempt resulted in an even greater increase in the leak from 639 to 1,771 ppm. Repairs had to be delayed so that the facility could consult with an outside expert and evaluate how best to resolve the leak in light of the significant increase after the initial repair attempt.

In consultation with the contractor, it was determined that a temporary clamp would be needed to control the leak until the next planned outage and scheduled vessel inspection. The installation of a temporary clamp is not a minor engineering matter and requires the development of engineered calculations, drawings, extensive evaluation for approval, Management of Change process, safety and environmental assessment, fabrication of the clamp, and a new chemical approval for the sealant. Ultimately, the temporary clamp was engineered, fabricated, installed, and the leak stopped within 15 days of placing the sphere manway on Delay of Repair. It was calculated that about 10.1 lbs of vinyl chloride was released during the time required to repair the sphere, which is similar to leaks from any other equipment at the facility that is subject to the LDAR monitoring program.

Application of LDAR, coupled with prompt repair, is both the MACT floor and reflective of best practices for minimizing emissions from pressure vessels. EPA has no basis for requiring otherwise and reconsideration must be granted.

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[104] 42 U.S.C. § 7412(h)(1); *see also Sierra Club v. EPA*, 479 F.3d at 883.

VIII. Vapor Balancing

A. Vapor Balancing is Widely Used in This Source Category

As **Table 8** indicates, vapor balancing is used widely throughout the industry to load storage vessels and unload transportation vehicles (*e.g.*, railcar). Indeed, it is virtually impossible to unload a vinyl chloride railcar without any HAP emissions without using vapor balancing. When unloading a vinyl chloride railcar, there are two options for loading a storage vessel: (1) use vinyl chloride pressure to push vinyl chloride into the storage sphere and vapor balance the sphere back to the railcar; or (2) use nitrogen pressure to push vinyl chloride to the storage sphere and send the vapors to the control device. The second option results in low-level HAP emissions through the control device. In contrast, when using vapor balancing, vapors from the railcar, the sphere, and the lines are recovered, thus ensuring there are no HAP emissions from the process. Accordingly, the Working Group submits that EPA should reconsider and expressly allow the ongoing use of vapor balancing at PVC facilities.

Table 8: PVC Industry Use of Vapor Balancing

Facility	Reported Practice of Vapor Balancing
Dow Midland	Yes
Formosa Baton Rouge	Yes
Formosa Delaware	Yes
Formosa Point Comfort	Yes
Formosa SPVC	No
OxyVinyls Deer Park	No
OxyVinyls Pasadena	No
OxyVinyls Pedricktown	No
PolyOne Henry	No
PolyOne Pedricktown	No
Shintech Addis	Yes
Shintech Freeport	Yes
Shintech Plaquemine	Yes
Westlake Calvert City	Yes
Westlake Geismar	Yes
Georgia Gulf Aberdeen	Yes
Georgia Gulf Plaquemine	Yes

B. Vapor Balancing is a Proven Control Technology

As the industry noted in its comments, vapor balancing is a proven control technology that EPA has allowed as a control option for storage tanks in many other MACT rules, including the Agency's recently proposed Uniform Standards.[105] Although vapor balancing is not addressed in the final PVC MACT rule, the Working Group submits that vapor balancing is not prohibited by the final rule, particularly as no emissions are released from the practice. Nevertheless, both industry and the Agency would benefit from a common and consistent understanding of the practice through explicit regulatory recognition. In addition, its widespread use throughout the industry would make compliance and enforcement of vapor balancing as a Section 6.36(g) alternative means of emission limitation impracticable, further elevating the need for correction on reconsideration.

[105] Docket Document No. EPA-HQ-OAR-2002-0037-0146, at 87.

C. Vapor Balancing Should be Explicitly Recognized in the Rule

In their comments, Working Group members requested that EPA allow vapor balancing as a means of controlling emissions from storage vessels. The final PVC MACT rule is silent on the issue, and according to EPA, it did not have data on the appropriateness of using vapor balancing on storage vessels in the PVC source category.[106] A Working Group member raised this issue with the Agency at their April 18, 2012 meeting, and reminded the EPA staff that vapor balancing is a widespread activity throughout the industry. Under the circumstances of a widely used and proven control technology that is fundamental to avoiding emissions during normal operations, such as railcar loading, it would be arbitrary and capricious for the Agency not to exercise its discretion, grant reconsideration, and add a provision in the PVC MACT that explicitly allows vapor balancing.

IX. Requirements for Combined Process Vents Must be Reconsidered

Several PVC production facilities share process vent and other control devices with facilities in other source categories, including facilities that are in the ethylene dichloride and/or vinyl chloride ("EDC/VCM") production industry or subject to the Hazardous Organic NESHAP ("HON") or Miscellaneous Organic NESHAP ("MON"). During the development of the PVC MACT, several EDC/VCM manufacturers, many of which also are subject to the PVC MACT, received a Section 114 Request from EPA for survey and test data to support the development of an EDC/VCM MACT rule. Given this ongoing and clearly overlapping initiative, the Working Group urged EPA to postpone development of the PVC MACT in favor of a consolidated rule covering PVC, EDC, and VCM facilities, or two rules that are consistent. In separately filed comments, a Working Group member maintained that EPA should allow compliance with the MON/HON if greater than 50 percent of the HAP flow is from a MON/HON-regulated facility. Another Working Group member recommended that EPA set process vent limits for combined flow control devices based on weighted average flow volumes.

A. It was Not Feasible to Comment on the New Data on Which EPA Based the Final Rule Requirements for Combined Process Vents

In the proposed PVC MACT rule, EPA did not differentiate between PVC-only and PVC-combined process vents in setting emission limits. In the final rule, however, EPA promulgated separate emission limits for PVC-only process vents and PVC-combined process vents. The emission limits for combined process vents were a surprise to the PVC industry because the limits are based on EDC/VCM data developed for purposes of the EDC/VCM Section 114 Request and rulemaking. Indeed, EDC/VCM sampling was not completed until well after the close of the PVC MACT comment period, and the data was not placed in the docket until January 25, 2012, less than three weeks before the Administrator signed the final PVC MACT rule. Accordingly, it was impracticable for the Working Group to review and comment upon EPA's treatment of the EDC/VCM data before publication of the final PVC MACT rule.

[106] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 12-65.

B. The Applicable Scope of the Combined Process Vent Provision Merits Reconsideration Based on the Conflict Between the Preamble Explanation and the Language of the Final Rule

As the D.C. Circuit noted in *Portland Cement Association v. EPA*,[107] the Agency has an obligation to "acknowledge and account for a changed regulatory posture the agency creates—especially when the change impacts a contemporaneous and closely related rulemaking."[108] Notwithstanding the clear basis for mandatory reconsideration of the combined process vent emissions limitations, the Working Group's concern here is focused on the applicability of the combined process vent limitation to facilities outside the PVC source category. Specifically, Section 63.11865 of the rule expressly states that the PVC MACT does not apply to chemical manufacturing process units that produce VCM or other raw materials used to produce PVC. In contrast, the preamble to the final PVC MACT indicates that facilities in a different source category handling vent streams from multiple facilities must comply with all rules applicable to their common control device, whether it is the HON, the PVC MACT, or another rule. According to the Agency:

> *If an emission point is subject to both the PVC NESHAP and other NESHAP because emissions from two source categories are vented to the same control device, both standards apply. Multiple standards applicable to one emission point for the same pollutant are not necessarily "conflicting" or "inconsistent." In some standards, the EPA has allowed compliance with another overlapping standard where that other overlapping standard was determined to be at least as stringent...If the EPA were to allow sources to meet the requirements from overlapping, but potentially less stringent rules in lieu of the PVC standards, there is the possibility that PVC facilities would not meet the MACT floor based standards in this rule. Although we recognize that facilities may be subject to different NESHAP regulations, sources are responsible for ensuring that they comply with all applicable regulations. Many NESHAP regulations provide a wide variety of compliance options, and, as such, it would be a difficult task to identify in advance which is the most stringent requirement in each case.*[109]

When Working Group members met with EPA on April 18, 2012, to discuss the final rule, one critical question raised was the impact of the combined process vent limit on EDC/VCM and other HON or MON units that may share a control device with a PVC unit. The staff repeatedly stressed that the most stringent limit would apply, but it was not clear whether the staff's focus was only on the PVC side of the equation or whether they intended also for the HON/MON units to comply with the new PVC MACT limits. This is a critical issue as HON/MON units currently are not subject to some of the more stringent limits in the PVC MACT and HON/MON unit operators were not afforded the opportunity to comment on whether their control devices could meet the process vent and related operating requirements finalized in the PVC MACT for combined flow.

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107 *Portland Cement Ass'n*, 665 F.3d at 187 (D.C. Cir. 2011).

108 *Id.*

109 77 Fed. Reg. 22,869.

It is not a simple matter to parse out "the most stringent" operating requirements between different units with different operating conditions and different rule requirements. Two examples illustrate how a shared MACT-affected control device is now subject to new requirements for which the affected sources with "process vents originating from another source category" did not have an opportunity to review, comment, and resolve the discrepancies and conflicts:

1. At 40 C.F.R. § 63.11940(c)(2), the final PVC MACT requires that the following be installed on required HCl scrubbers: pressure gauges; a temperature monitoring device at the scrubber gas stream exit; or a specific gravity device. HON does not require any other monitoring devices (*see* 40 C.F.R. § 63.114(a)(4)), nor is it clear that this equipment would be appropriate for control devices generally regulated under the HON or MON.

2. Taking PVC MACT's Table 1 and 2 emission limits for Dioxin/Furans ("D/F") as an example, Section 63.11925(c)(2) for the final PVC MACT requires affected sources to establish an operating limit as per Section 63.11880(b). PVC-combined process vent affected sources must now determine how to comply with this requirement for the affected source's PVC operations, along with the process vents from the other source category (*e.g.*, HON or MON), which do not have D/F limits.

If EPA intended for the HON/MON units to comply with the new PVC MACT limits, then EPA has erred and violated the admonishment of the *Portland Cement* court that "it would certainly be arbitrary, as well as a violation of the CAA itself, for EPA to set one standard based on data already placed in another source category in light of the mutual exclusivity of the standards themselves,"[110] particularly as none of the facilities in the EDC/VCM source category have had an opportunity to comment on these limits and the new potentially applicable operating requirements. Even if the Agency's approach is permissible, the rule is silent, and the staff has not addressed to what extent, if any, the most stringent standard extends back to all source operations (*e.g.*, emission profiles at the process equipment) up to and including operating parameters for the control device as well as emission limits for the vent discharging to the atmosphere. Nor has EPA resolved any conflicting provisions.

For these reasons, the final rule should be amended or clarified consistent with the express language in Section 63.11865.

X. The New Requirements for Emission Profiles are Overbroad and Must be Reconsidered

Pursuant to Section 63.11925(g) of the final rule, which was not in the proposed rule, PVC facilities must now "characterize each process vent by developing an emissions profile for each contributing continuous process vent, miscellaneous vent and batch process vent," as part of their initial and continuous compliance demonstrations.[111] The emission profile is intended to

[110] *Portland Cement Ass'n*, 665 F.3d at 186.

[111] 77 Fed. Reg. 22,915 (codfied at 40 C.F.R. § 63.11925(g)).

describe the characteristics of the process vent stream under either absolute or hypothetical worst-case conditions so facilities can demonstrate that "process vent streams are serving a valid process purpose and are not being diluted prior to control."[112] This new requirement is in addition to the requirement at Section 63.11945 that an emission profile must be used to demonstrate that the maximum load is sent to the control device for initial and periodic compliance testing.

The Agency's changes to the definitions of process vent, batch process vent, and continuous process vent, as well as the addition of a new miscellaneous vent category after the close of the comment period, expanded the emission profile requirement to cover vents not addressed by the proposed rule. The emission profile requirement under the proposed rule applied only to batch process vents and was limited to establishing stack testing "worst case conditions."[113] The final rule not only expands the emission profile requirement, but does so in a manner that is unnecessary and overly burdensome to the PVC industry.

In other words, the proposed rule would have required only one emission profile at the inlet of a control device, whereas the final rule requires the development of hundreds of emission profiles from a PVCPU. The industry did not have an opportunity to comment on the unworkable new profile requirements. Accordingly, EPA must reconsider the emission profile requirement for process vents.

A. It was Not Feasible to Comment on the Agency's New, Much Broader Approach in the Final Rule to Emission Profiles

EPA initially sought to require emission profiles "for the vent to the control device that describes the characteristics of the vent stream at the inlet to the control device under worst-case conditions."[114] The final rule, however, requires PVC facilities to develop emission profiles for "each contributing continuous process vent, miscellaneous vent and batch process vent."[115]

In addition, the final rule eliminated, without notice, long-standing exclusions from the batch process vent and continuous process vent definitions, certain streams the Agency had determined were *de minimis* (*e.g.*, analyzer vents, sample emissions) or covered under the LDAR program or work practice standards and incorporated into the MON upon its reconsideration. For example, pieces of equipment that are subject to emission limits and work practices for equipment leaks (*e.g.*, valves, sample connection system) are no longer exempt from the batch process vent definition. As such, emissions profiles must be developed for such valves and sampling connections systems under the new characterization requirements of Section 63.11925(g)(1), which apply to batch process vents. Thus, as an initial matter, the Agency's compliance focus changed from consideration of the stream at the inlet to the control equipment,

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[112] 77 Fed. Reg. 22,855.

[113] 76 Fed. Reg. 29,577 (to be codified at 40 C.F.R. § 63.11945(b)(3).

[114] 77 Fed. Reg. 22,922 (codified at § 63.11945(c)(3)) (emphasis added).

[115] 77 Fed. Reg. 22,915 (codified at § 63.11925(g)) (emphasis added).

to consideration of data describing the vent stream HAP composition and flow from each of very many process components and emission points.[116]

EPA gave no indication in the proposed rule that it intended such an expansive change to the process vent structure of the PVC MACT, or to terminate the long-standing exclusions for otherwise regulated streams. Thus, the Working Group had no notice of, or opportunity to comment on, this new process vent approach, which came as quite a surprise to the PVC industry.

B. EPA's Burden Assessment of the Expanded Profile Requirements was Mistaken

In promulgating the final rule, the Agency certainly appeared to envision, incorrectly, that the emission profile requirement would impose a very limited burden on PVC facilities:

> *We expect facilities to already have inventories and previous test results available to develop their emissions profile. All of the facilities that provided information in response to the August 21, 2009, PVC CAA section 114 survey, developed emission profiles. Additionally, we are allowing the emissions profile to be based on engineering assessment or measurement. Because of these reasons, we do not anticipate additional burden from this requirement.*[117]

Contrary to this analysis, and contrary to the proposed rule, EPA is requiring, without opportunity for comment, that industry disregard existing emission profiles collected from the inlet to the control device and is requiring a huge profiling effort for initial and ongoing compliance. The final regulatory text encompasses a much broader universe of vents to be profiled, a more comprehensive and, in some cases, impractical testing regime, and much greater reporting requirements than perhaps the Agency realized.

For example, as the Working Group reads 40 C.F.R. § 63.11985(c)(2), PVC facilities must submit a batch precompliance report six months before the rule's compliance date for each and every vent, and each and every emission episode, associated with that batch process. The problem is that the Agency's definition of covered vents appears to encompass apertures, connections, and other points beyond those to the control device. EPA proposed to define continuous process vents, in relevant part as "...the point of discharge to the atmosphere (or the point of entry into a control device, if any) of a gas stream..."[118] The final rule, however, defines "continuous process vent" as:

> *a vent from a continuous PVCPU operation through which a HAP-containing gas stream has the potential to be released to the atmosphere except that it is required by this subpart to [be] routed to a closed vent system and control device...*

Emission profiles for batch process vents must be developed through calculations set forth in 40 C.F.R. § 63.11950. The Administrator must approve any deviations from the listed

[116] Docket Document No. EPA-HQ-OAR-2002-0037-0185, at 10-55.

[117] 77 Fed. Reg. 22,855.

[118] 76 Fed. Reg. 29,596.

equations. Emission profiles, now apparently including data on flow rate and individual HAP concentrations, must be determined for continuous process vents by testing via methods not suited for inprocess pipes, or by engineering assessments. In addition, emission profiles for miscellaneous vents must be determined through an engineering assessment or testing approved by the Administrator. No PVC facility has on hand inventories and test results to address each HAP and flow rate information needed to develop an emission profile for the expanded list of individual process emission points covered by the final rule. Thus, as currently worded, the emission profile reporting and recordkeeping burdens are overwhelming.

C. *The Revised Definition of Continuous Process Vent is Overbroad, Carries Unintended Consequences, and Must be Corrected*

Working Group members are concerned that by eliminating from the definition of "continuous process vent" and "batch process vent" any reference to "the point of discharge to the atmosphere (or point of entry to a control device)" or any other references to discharges to the atmosphere, that the Agency has significantly expanded the scope of the term. In the absence of a regulatory definition for the term "vent," the general and broader meaning of the term as "an opening for the passage or escape of a liquid, gas or vapor,"[119] must apply. Further complicating the issue, "miscellaneous vents" are subsumed in the definition of "process vents," meaning that emissions profiles must be developed for each "gaseous emissions from samples, loading and unloading lines, slip gauges, process wastewater treatment systems and pressure relief devices that are routed through a closed vent system to a control device and that are not equipment leaks." Minor changes in raw materials can impact process vent stream compositions so that emission profile calculations appear to be needed and reported every time a change in recipe takes place. There is an added burden for EPA as well if detailed information on the composition of raw materials and their decomposition products must be submitted to the Agency, as such information must be managed as Confidential Business Information.

In addition, individual batch and miscellaneous vent streams from a typical PVC plant (*see* **Figure 3**) flow to a centralized recovery system (often containing a gasholder where gas stream compositions are mixed and equalized) and then flow as a continuous vent stream to process condensers where the majority of the vinyl chloride and some of the non-VCM HAP is recovered and returned to the process for reuse. Most facilities tested the inlet stream to their control device as part of the Section 114 Request. This data will likely be sufficient with a few other engineering assumptions to determine the maximum load to the control device for the compliance tests. Any further calculations upstream of this point, therefore, are of minimal use with no environmental or regulatory benefit.

XI. Stay of the PVC MACT Pending Reconsideration is Warranted

The Administrator should stay the application of the final PVC MACT rule pending reconsideration. Section 307(d)(7)(B) of the Act authorize an administrative stay during reconsideration. Given the errors, textual ambiguities, and regulatory conflicts identified in the preceding discussions, as well as the resulting impediments to normal operations at PVC facilities, it would be a manifest injustice for the Agency to proceed without staying the final

[119] Webster's II New Riverside University Dictionary 1280 (1988).

rule. Accordingly, the Working Group specifically requests that EPA take all necessary and appropriate steps to stay and defer the compliance deadlines and other provisions of the PVC MACT pending outcome of the reconsideration process.

XII. Conclusion

For the foregoing reasons, the Administrator must convene a proceeding for reconsideration of the PVC MACT Rule, stay implementation of the Rule pending reconsideration, and extend the compliance deadlines applicable to the Rule to reflect the stay period.

LIST OF EXHIBITS

EXHIBIT I

Oxy Vinyls, LP Memorandum
re PVC MACT Survey Wastewater Stripper Error,
dated June 6, 2012

OXYVINYLS

Houston Operations
PVC Technical Group

Interoffice Memo

TO: John Westendorf, Mgr Water & Solid Waste

FROM: Monica Ortega, Process Engineer

DATE: 06/06/2012

SUBJECT: PVC MACT Survey Wastewater Stripper Error

Distribution: Jonathan Witt, PVC Technical Manager; Craig Horak, Production Manager; Jadie Pryor, Environmental Engineer

This memorandum is in response to your questions concerning certain values EPA used to calculate the wastewater stripper emissions limits for major and area sources under the PVC MACT and GACT regulations issued by EPA on April 17, 2012. Specifically, you asked for information on the source of the numbers reported by OxyChem's Deer Park PVC facility in response to EPA's survey request issued in August 2009 to major sources and in September 2009 to area sources, such as the Deer Park PVC facility.

Form K-3 of the survey requested information on the facility's process wastewater streams. Form K-3-b specifically requested HAP and VOC concentration data collected in 2008 for the process wastewater streams. On Form K-3-b, the Deer Park facility reported a sample concentration of 0.018 ppmv for Acetaldehyde in the process wastewater streams (Stream ID #s W-307, W-308 and W-310). We also reported concentrations of 0.065 ppmv for Vinyl Chloride and 0.4 ppmv for "Other" HAPs (same Stream ID #s).

I was asked by my manager in September 2009 to gather information for preparing the survey response for the Deer Park PVC facility. I was aware that the facility collected and analyzed vinyl chloride concentration data at the outlet of the wastewater stripper on a weekly basis, as part of OxyChem's process control program and to verify compliance with the Vinyl Chloride NESHAP regulations. It is the facility's practice that upon receipt of the analytical results, on-site laboratory personnel are responsible for entering the results into a computer software program.

In researching whether any additional process wastewater samples had been collected in 2008, I reviewed the facility's annual 2008 Emissions Inventory (EI) report submitted to the Texas Commission on Environmental Quality in 2009. The EI report included an emissions data sheet for an emission point identified as "DPS-031 Wastewater Stripper." I assumed that the reported data was for the process wastewater stripper. The data sheet reported a concentration of 18.0 ug/liter for Acetaldehyde (essentially equivalent to 0.018 ppmv). It also reported concentrations of 64.5 ug/liter for VOC and 400.5 ug/liter Total Non-VCM. I entered these values onto EPA survey Form K-3-b for the facility's process wastewater streams, which was submitted to EPA on March 3, 2010.

After EPA released the final PVC MACT and GACT standards earlier this year, you reviewed EPA's background documents for calculating the process wastewater emissions limits. EPA included the 0.018 Acetaldehyde value in the MACT and GACT floor calculations, but did not use the VCM or Total Non-VCM values reported by the Deer Park facility. You questioned the source of the 0.018 number and asked me review the source documents. Upon close analysis, we discovered that the data in the EI report identified for the "DPS-031 Wastewater Stripper" was supposed to represent data from a groundwater remediation stripper at the Deer Park facility, not the process wastewater stripper. The groundwater stripper is located in the water treatment facility adjacent to the PVC facility and is completely unrelated to the PVC process wastewater stripper that is regulated by the PVC MACT and GACT standards. This error was not detected until you asked me to review the source numbers reported in the Deer Park facility's survey response after you reviewed EPA's final wastewater emissions limit calculations.

EXHIBIT II

E-mail and Wastewater Data from Barry Christensen, Occidental Chemical Corporation, for Oxy Vinyls, LP, to Jodi Howard, EPA, dated September 15, 2010

From: Howard.Jodi@epamail.epa.gov [mailto:Howard.Jodi@epamail.epa.gov]
Sent: Wednesday, September 15, 2010 6:54 PM
To: Christensen, Barry H.
Subject: Re: Response to More questions regarding PVC test and survey data

Thanks Barry.
****

Jodi Howard, Environmental Engineer
U.S. EPA - Office of Air Quality Planning and Standards Sector Policies and Program Divisions
Coatings and Chemicals Group Mail Code: E143-01 Research Triangle Park, NC 27711
Phone: 919-541-4607 Fax: 919-541-0246

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| From: |
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|<Barry_H._Christensen@oxy.com> |
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| To: |
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|<Howard.Jodi@epamail.epa.gov> |
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| Cc: |
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|<John_Westendorf@oxy.com> |
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|------------>
| Date: |
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|09/15/2010 07:06 PM |
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| Subject: |
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|Response to More questions regarding PVC test and survey data |
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Jodi,

enclosed is a few additional data HAP points on wastewater that we took at the time of our sampling. The first sheet for our Pasadena plant encompasses

wastewater that has been steam stripped by our onsite wastewater stripper. The second sheet includes data from our Pedricktown plant that flows directly to the onsite biological wastewater treatment plant operated by PolyOne. It is separate from the process wastewater with VCM that flows separately to the onsite PolyOne steam stripper. We can provide the back up outside laboratory reports should you need them.

Pls let me know of any questions on this data.

Barry Christensen
Occidental Chemical Corp.
Mgr Air Quality
972 404 3209

-----Original Message-----
From: Christensen, Barry H.
Sent: Wednesday, August 25, 2010 3:51 PM
To: 'Howard.Jodi@epamail.epa.gov'
Subject: RE: Response to More questions regarding PVC test and survey data

Jodi,

in the meeting with VI you mentioned you were not able to locate our 4/21/10 submission. We are sending another copy to your attention which you should receive tomorrow.

Thanks for meeting with us yesterday. The meeting prompted some thought on a few other items we can send that may supplement some gaps in information.

(See attached file: OV Wastewater Analytical Data (with MDL values).xls)

Resin Sampling Results for Wastewater Stripper
OxyVinyls, LP
Pasadena, TX

Wastewater Type			**Process water**					
Flow Diagram Equipment No.			**Wastewater stripper (U-1202)**					
Flow Diagram wastewater Stream number			**Discharge of the wastewater stripper (Stream W-1221) that flows to biological treatment**					
Suspension Grade			GP, HMW, LMV*	GP, LMW	GP, HMW, LMW	GP, HMW, LMW	GP, HMW, LMW	GP, HMW, LMW
Date Sampled			12/22/2009	12/29/2009	1/6/2010	1/12/2010	1/19/2010	1/28/2010
Date Received by Lab			12/24/2009	12/31/2009	1/8/2010	1/14/2010	1/21/2010	1/30/2010
Lab Report Number			JA35458	JA35466	JA35476	JA35488	JA35502	JA36409
Compound	**CAS No.**	**Method of Analysis**	**Concentration (ug/l)**					
Ethylene Glycol	107-21-1	DAI by GC/MS 8260 SIM	ND(120)	ND(120)	ND(120)	*ND(120)*	*ND(120)*	*ND(120)*
Benzene	71-43-2	SW846 8260 B	*ND(1.2)*	*ND(1.2)*	*ND(4.7)*	*ND(12)*	*ND(1.2)*	*ND(59)*
Chloroethane	75-00-3	SW846 8260 B	*ND(1.9)*	**2.8 J**	*ND(7.4)*	*ND(19)*	**5.8**	*ND(93)*
Chloroform	67-66-3	SW846 8260 B	*ND(1.2)*	**4.3 J**	*ND(4.7)*	*ND(12)*	*ND(1.2)*	*ND(59)*
Chloromethane	74-87-3	SW846 8260 B	*ND(1.4)*	*ND(1.4)*	*ND(5.8)*	*ND(14)*	*ND(1.4)*	*ND(72)*
1,1-Dichloroethane	75-34-3	SW846 8260 B	*ND(1.4)*	*ND(1.4)*	*ND(5.7)*	*ND(14)*	*ND(1.4)*	*ND(72)*
1,2-Dichloroethane	107-06-2	SW846 8260 B	**2.7 J**	**2.8 J**	*ND(6.7)*	*ND(17)*	**2.6 J**	*ND(83)*
1,1-Dichloroethene	75-35-4	SW846 8260 B	*ND(2.0)*	*ND(2.0)*	*ND(7.9)*	*ND(20)*	*ND(2.0)*	*ND(99)*
Isopropylbenzene	98-82-8	SW846 8260 B	*ND(2.9)*	*ND(2.9)*	*ND(11)*	*ND(29)*	*ND(2.9)*	*ND(140)*
Toluene	108-88-3	SW846 8260 B	*ND(1.5)*	*ND(1.5)*	*ND(6)*	*ND(15)*	*ND(1.5)*	*ND(75)*
2,2,4-Trimethylpentane	540-84-1	SW846 8260 B	*ND(2.2)*	*ND(2.2)*	*ND(8.8)*	*ND(22)*	*ND(2.2)*	*ND(110)*
Vinyl Bromide	593-60-2	SW846 8260 B	*ND(0.50)*	*ND(0.50)*	*ND(2.0)*	*ND(5.0)*	*ND(0.50)*	*ND(25)*
Vinyl Chloride	75-01-4	SW846 8260 B	**40**	**38**	**21**	**36.9 J**	**72**	ND(110)
Xylene (Total)	1330-20-7	SW846 8260 B	*ND(1.3)*	*ND(1.3)*	*ND(5.0)*	*ND(13)*	*ND(1.3)*	ND(63)
Phenol	108-95-2	SW846 8270 C SW846 3510C	*ND(0.58)*	*ND(0.58)*	*ND(0.58)*	*ND(0.58)*	*ND(0.64)*	*ND(0.62)*
Acetophenone	98-86-2	SW846 8270 C SW846 3510C	**5,220**	**9,110**	**4,790**	**9,010**	**9,190**	**9,950**
Hydroquinone	123-31-9	SW846 8270 C SW846 3510C	*ND(5.0)*	*ND(5.0)*	*ND(5.0)*	*ND(5.0)*	*ND(5.6)*	*ND(5.4)*
Methanol	67-56-1	SW846-8015 (DAI)	**656,000**	**858,000**	**806,000**	**490,000**	**265,000**	**620,000**
Formaldehyde	50-00-0	SW846 8315 SW846 8315	**25**	*ND(6.3)*	**162**	*ND(6.3)*	*ND(6.3)*	*ND(6.3)*
Acetaldehyde	75-07-0	SW846 8315 SW846 8315	**844**	**10.1 J**	**8,370**	**85**	*ND(4.8)*	**2,110**

Detected values are reported in bold font.
MDL values are reported in italic font for ND values.

* GP = General Purpose resin
HMW = High Molecular Weight resin
LMW = Low Molecular Weight resin

The samples were analyzed by Accutest Laboratories.

Analytical Sampling Results for Sump, Column, Centrate and Scrubber Wastewater
OxyVinyls, LP
Pedricktown, NJ

Wastewater Type			LP Sump	LP Sump	Stripping Column	Centrate	Centrate	Centrate	Centrate	Centrate	Centrate	Centrate	Centrate	Centrate	Centrate	Centrate	Centrate	Scrubber	Scrubber	Scrubber	Scrubber	Scrubber	Scrubber
Flow Diagram Equipment No			U-602	U-602	U-203	U-603	U-603	U-603	U-603	U-603	U-603	U-603	U-603	U-603	U-603	U-603	U-603	C-212	C-212	C-212	C-212	C-212	C-212
Flow Diagram wastewater Stream number			W-604	W-604	Equipment Opening condensate to W-604	S-619	S-620	S-620	S-620	S-620	S-620	S-620	S-620	S-620	S-620	S-620	S-620	W-200	W-200	W-200	W-200	W-200	W-200
Suspension Grade			Med and High Molecular Wt	General Purpose	Med and High Molecular Wt	Med and High Molecular Wt	Med and High Molecular Wt	Med and High Molecular Wt	Med and High Molecular Wt	General Purpose	General Purpose	General Purpose	General Purpose	General Purpose	General Purpose	Med and High Molecular Wt	General Purpose	Med and High Molecular Wt	Med and High Molecular Wt	General Purpose	General Purpose	Med and High Molecular Wt	General Purpose
Date Sampled			11/4/2009	1/17/2009	11/4/2009	11/1/2009	11/2/2009	11/3/2009	11/4/2009	11/9/2009	11/10/2009	11/11/2009	11/1[illegible]	11/13/2009	11/14/2009	12/19/2009	1/18/2010	11/2/2009	11/4/2009	11/[illegible]	11/[illegible]	12/19/2009	1/15/2010
Date Received by Lab			11/5/2009	1/17/2009	11/5/2009	11/2/2009	11/3/2009	11/4/2009	11/4/2009	11/9/2009	11/10/2009	11/11/2009	11/1[illegible]	11/1[illegible]	11/14/2009	12/20/2009	1/18/2010	11/3/2009	11/4/2009	11/[illegible]	11/[illegible]	12/[illegible]	1/15/2010
Lab Report Number			JA32106	JA37850	JA32106	JA31877	JA31878	JA31992	JA32106	JA32436	JA32471	JA32573	JA328[illegible]	JA3[illegible]*	JA33006	JA35945	JA37828	JA31878	JA32106	JA32436	JA33536	JA35945	JA37676
Compound	CAS No.	Method of Analysis	Concentration (ug/l)															Concentration (ug/l)					
Ethylene Glycol	107-21-1	DAI by GC/MS 8260 SIM	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	No Test	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)	ND(120)
Benzene	71-43-2	SW846 8260 B	ND(0.23)	ND(0.23)	ND(1.2)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)
Chloroethane	75-00-3	[illegible] 8260 B	ND(0.37)	**3.0**	**59.0**	ND(0.37)	ND(0.37)	ND(0.37)	ND(0.37)	**1.9**	**2.1**	**1.8**	**2.8**	**2.1**	**5.3**	ND(0.37)	**0.9 J**	ND(0.37)	ND(0.37)	ND(0.37)	ND(0.37)	ND(0.37)	ND(0.37)
Chloroform	67-[illegible]-3	[illegible] 8260 B	ND(0.23)	ND(0.23)	ND(1.2)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	**1.8**	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)	ND(0.23)
Chloromethane	74-87-3	SW846 8260 B	ND(0.29)	ND(0.29)	**13.4**	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)
1,1-Dichloroethane	75-34-3	SW846 8260 B	ND(0.29)	ND(0.29)	ND(1.4)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)	ND(0.29)
1,2-Dichloroethane	107-06-2	SW846 8260 B	ND(0.33)	ND(0.33)	ND(1.7)	ND(0.33)	ND(0.33)	ND(0.33)	ND(0.33)	**0.58 J**	**0.52 J**	**0.62 J**	**0.65 J**	**0.61 J**	**0.71 J**	ND(0.33)	ND(0.33)	ND(0.33)	ND(0.33)	ND(0.33)	ND(0.33)	ND(0.33)	ND(0.33)
1,1-Dichloroethene	75-35-4	SW846 8260 B	ND(0.40)	ND(0.40)	ND(2.0)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)	ND(0.40)
Isopropylbenzene	98-82-8	SW846 8260 B	**2.3**	ND(0.57)	**17.6**	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)	ND(0.57)
Toluene	108-88-3	SW846 8260 B	ND(0.30)	ND(0.30)	ND(1.5)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)
2,2,4-Trimethylpentane	540-84-1	SW846 8260 B	ND(0.44)	ND(0.44)	ND(2.2)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)
Vinyl Bromide	593-60-2	SW846 8260 B	ND(0.10)	ND(0.10)	ND(0.50)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)	ND(0.10)
Vinyl Chloride	75-01-4	SW846 8260 B	**2.5**	**23.4**	**2,960**	ND(0.44)	ND(0.44)	ND(0.44)	ND(0.44)	**3.6**	**3.8**	**2.5**	**3.8**	**3.3**	**11.1**	ND(0.44)	**2.0**	ND(0.44)	ND(0.44)	**1.3**	**0.52 J**	ND(0.44)	**1.4**
Xylene (Total)	1330-20-7	SW846 8260 B	ND(0.25)	ND(0.25)	ND(1.3)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)	ND(0.25)
Phenol	108-95-2	SW846 8270 C SW846 3510C	**23.8**	**1.7 J**	**25.3**	**15.5**	**20.7**	**24.0**	**26.2**	ND(0.58)	ND(0.58)	**2.0**	**3.1**	**2.5**	**3.7**	**23.2**	ND(0.60)	**20.5**	**23.0**	**3.3**	ND(0.58)	**24.1**	ND(0.58)
Acetophenone	98-86-2	SW846 8270 C SW846 3510C	**1,270**	**255**	**1,310**	**1,410**	**1,600**	**1,360**	**1,840**	**781**	**650**	**778**	**812**	**710**	**950**	**745**	**582**	**243**	**327**	**110**	**184**	**228**	**89.2**
Hydroquinone	123-31-9	SW846 8270 C SW846 3510C	ND(5.0)	ND(25)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.5)	ND(5.2)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.4)	ND(5.0)
Methanol	67-56-1	SW846-8015 (DAI)	**993**	**1,630**	**845**	**870**	**1,310**	**1,000**	**1,270**	**2,000**	**2,230**	**2,010**	**2,320**	**3,460**	**2,710**	**698**	**1,720**	**682**	**328**	**829**	**1220**	ND(34)	**308**
Formaldehyde	50-00-0	SW846 8315 SW846 8315	**610**	**175**	**277 J**	**300**	**589**	**590**	**613**	**464**	**400**	**165**	**181**	**150**	**164**	**276**	**625**	**914**	**1,110**	**756**	**327**	**633**	**300**
Acetaldehyde	75-07-0	SW846 8315 SW846 8315	**1,040**	**411**	**1,830**	**1,200**	**1,650**	**1,630**	**1,080**	**2,140**	**2,150**	**1,900**	**4,340**	**3,870**	**3,460**	**174**	**2,740**	**1,460**	**340**	**2830**	**947**	**659**	**679**

*Duplicate Sample

Detected values are reported in bold font.
Values reported with a "J" indicate an estimated value

The samples were analyzed by Accutest Laboratories

EXHIBIT III

Data and Calculation Spreadsheets from 13 PVC Facilities for Wastewater Stripper Discharge Non-Vinyl Chloride TOHAP Limits

EXHIBIT III
List of Data and Calculation Spreadsheets from 13 PVC Facilities for Wastewater Stripper Discharge Non-Vinyl Chloride TOHAP Limits

(submitted in the enclosed CD)

VI PVC MACT Wastewater Sampling Test Results 6-13-12.xlsx

WW TOHAP Recalc 06062012.xlsx

EXHIBIT IV

Process Vent Sampling Flow Rate and Concentration Data for Docket Document No. EPA-HQ-OAR-2002-0037-0107

Exhibit IV: Process Vent Sampling Flow Rate and Concentration Data for Docket Document No. EPA-HQ-OAR-2002-0037-0107

Facility	Control Device	Flow Rate (Inlet)	Flow Rate (Outlet)	THC Concentration Readings	CH4 Concentration	Other Analytes
FPC – DE	Thermal Oxidizer	Excel Spreadsheet: - PVC MACT FPC DE Testing-Emissions_Data.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC MACT FPC DE Testing-Emissions_Data.xls Worksheets: - TestingData-Outlet - TestingData-Outlet-jack - TestingData(DioxinFuran)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC MACT FPC DE Non CBI_CO-THC-CH4_Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - PVC MACT FPC DE Testing-Emissions_Data.xls Worksheets: - TestingData-Inlet - TestingData-Outlet - TestingData-Outlet-jack Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - PVC MACT FPC DE Testing-Emissions_Data.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
FPC – TX	Thermal Oxidizer	Excel Spreadsheet: - FPC TX PVC_Testing-Emissions_Data.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - FPC TX PVC_Testing-Emissions_Data.xls Worksheets: - TestingData-Outlet(VOST HAPs) - TestingData-Outlet (M26A & 320) - TestingData-Outlet (SVOL) - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - FPC TX Non-CBI - PVC_CO-THC-CH4_Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - FPC TX PVC_Testing-Emissions_Data.xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - FPC TX PVC_Testing-Emissions_Data.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
FPC – LA	Process Gas Incinerator/ Caustic Scrubber	Excel Spreadsheet: - FPC LA PVC_Testing-Emissions_Data1.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - FPC LA PVC_Testing-Emissions_Data1.xls Worksheets: - TestingData-Outlet Semivolatile - TestingData-Outlet VolsFTIR - TestingData(DioxinFuran)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - FPC LA Non CBI PVC_CO-THC-CH4_Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - FPC LA PVC_Testing-Emissions_Data1.xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - FPC LA PVC_Testing-Emissions_Data1.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
Georgia Gulf – Aberdeen	Thermal Oxidizer	Excel Spreadsheet: - Georgia_Gulf_Aberdeen_PVC_Testing- Emissions_Data Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Georgia_Gulf_Aberdeen_PVC_Testing-Emissions_Data Worksheet: - TestingData-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - GeorgiaGulf_Aberdeen_PVC_CO-THC-CH4_ Aberdeen_Monitoring_Final Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - GeorgiaGulf_Aberdeen_PVC_CO-THC-CH4_ Aberdeen_Monitoring_Final Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - Georgia_Gulf_Aberdeen_PVC_Testing-Emissions_Data Worksheet: - All Cell Nos: Rows 39-End, Columns C-E
Georgia Gulf – Plaquemine	Thermal Oxidizer	Excel Spreadsheet: - Georgia Gulf Chemicals_Plaquemine_PVC_Testing-Emissions_Data Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Georgia Gulf Chemicals_Plaquemine_PVC_Testing-Emissions_Data Worksheet: - TestingData-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Georgia Gulf Chemicals_Plaquemine_PVC_CO-THC-CH4_Monitoring Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - Georgia Gulf Chemicals_Plaquemine_PVC_CO-THC-CH4_Monitoring Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - Georgia Gulf Chemicals_Plaquemine_PVC_Testing-Emissions_Data Worksheet: - All Cell Nos: Rows 39-End, Columns C-E

Facility	Control Device	Flow Rate (Inlet)	Flow Rate (Outlet)	THC Concentration Readings	CH4 Concentration	Other Analytes
Oxy - Deer Park	LaPorte Thermal Oxidizer	Excel Spreadsheet: - Testing-Emissions Data Deer Park.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Testing-Emissions Data Deer Park.xls Worksheets: - TestingData(SVOCs)-Outlet - TestingData(VOC)-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - CO-THC-CH4 Deer Park MonitoringNC.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - Testing-Emissions Data Deer Park.xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - Testing-Emissions Data Deer Park.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
Oxy - Pasadena	Thermal Oxidizer	Excel Spreadsheet: - Testing-Emissions Data NC.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Testing-Emissions Data NC.xls Worksheets: - TestingData(VOC)-Outlet - TesingData(HCLCL2)-Outlet - TesingData(SVOC)-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - CO-THC-CH4_Monitoring Pasadena NC.xls Worksheet: - CO-THC-CH4 Monitoring Data (B) Cell Nos: Column D	Excel Spreadsheet: - Testing-Emissions Data NC.xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - Testing-Emissions Data NC.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
Shintech – Addis	Thermal Oxidizer/ Scrubber	Excel Spreadsheet: - PVC_Testing-Emissions_Data.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC_Testing-Emissions_Data.xls Worksheets: - TestingData-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC_CO-THC-CH4_Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - PVC_Testing-Emissions_Data.xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - PVC_Testing-Emissions_Data.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
Shintech – Freeport	Incinerator/ Scrubber	Excel Spreadsheet: - Shintech PVC_Testing-Emissions_Data 022610.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Shintech PVC_Testing-Emissions_Data 022610.xls Worksheets: - TestingData-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Shintech 30-Day PVC_CO-THC-CH4_Monitoring 022610.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - Shintech PVC_Testing-Emissions_Data 022610.xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - Shintech PVC_Testing-Emissions_Data 022610.xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
Shintech – Plaquemine	Thermal Oxidizer/ Scrubber	Excel Spreadsheet: - PVC Testing-Emissions Data.xls Worksheet: - TestingData-Inlet_PVC Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC Testing-Emissions Data.xls Worksheet: - TestingData-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC CO-THC-CH4 Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - PVC Testing-Emissions Data.xls Worksheet: - TestingData-Outlet Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - PVC Testing-Emissions Data.xls Worksheet(s): - TestingData-Outlet - TestingData(DioxinFuran)-Outlet Cell Nos: Rows 39-End, Columns C-E

Facility	Control Device	Flow Rate (Inlet)	Flow Rate (Outlet)	THC Concentration Readings	CH4 Concentration	Other Analytes
Westlake – Calvert City	Thermal Oxidizer	Excel Spreadsheet: - PVC_Testing-Emissions_Data- Calvert City_2-26-10 .xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC_Testing-Emissions_Data- Calvert City_2-26-10 .xls Worksheets: - TestingData-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC_CO-THC-CH4_Monitoring-Calvert City_2-26-10.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - PVC_Testing-Emissions_Data- Calvert City_2-26-10 .xls Worksheets: - All Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - PVC_Testing-Emissions_Data- Calvert City_2-26-10 .xls Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
Westlake – Geismar	Primary and Oxy Incinerators, Incinerator Scrubber	Excel Spreadsheet: - PVC_Testing-Emissions_Data-Geismar.xlsx Worksheets: - TestingData-Inlet (PVC WET) - TestingData-Inlet (PVC DRY) - TestingData-Inlet (OXY REACTOR) - TestingData-Inlet (UVS) Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC_Testing-Emissions_Data-Geismar.xlsx Worksheets: - TestingData-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PVC_CO-THC-CH4_Monitoring-1-Geismar.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - PVC_Testing-Emissions_Data-Geismar.xlsx Worksheets: - TestingData-Outlet - TestingData(DioxinFuran)-Outlet - TestingData(PCB)-Outlet Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - PVC_Testing-Emissions_Data-Geismar.xlsx Worksheets: - All Cell Nos: Rows 39-End, Columns C-E
PolyOne – Henry	VGA	Excel Spreadsheet: - Henry-PVC_Testing-Emissions_Datafor VI.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Henry-PVC_Testing-Emissions_Datafor VI.xls Worksheet: - TestingData-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - Henry- PVC_CO-THC-CH4_Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - Henry-PVC_Testing-Emissions_Datafor VI.xls Worksheets: - TestingData-Inlet - TestingData-Outlet Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - Henry-PVC_Testing-Emissions_Datafor VI.xls Worksheets: - TestingData-Inlet - TestingData-Outlet Cell Nos: Rows 39-End, Columns C-E
PolyOne – Pedricktown	VGA	Excel Spreadsheet: - PolyOne Pedricktown PVC_Testing-Emissions_Data for KH.xls Worksheet: - TestingData-Inlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PolyOne Pedricktown PVC_Testing-Emissions_Data for KH.xls Worksheet: - TestingData-Outlet Cell Nos: Row 31, Columns C-E	Excel Spreadsheet: - PolyOne Pedricktown PVC_CO-THC-CH4_Monitoring.xls Worksheet: - CO-THC-CH4 Monitoring Data Cell Nos: Column D	Excel Spreadsheet: - PolyOne Pedricktown PVC_Testing-Emissions_Data for KH.xls Worksheets: - TestingData-Inlet - TestingData-Outlet Cell Nos: Row 36, Columns C-E	Excel Spreadsheet: - PolyOne Pedricktown PVC_Testing-Emissions_Data for KH.xls Worksheets: - TestingData-Inlet - TestingData-Outlet Cell Nos: Rows 39-End, Columns C-E
Oxy – Pedricktown	VGA	Routed through PolyOne Pedricktown facility	Routed through PolyOne Pedricktown facility	Routed through PolyOne Pedricktown facility	Routed through PolyOne Pedricktown facility	Routed through PolyOne Pedricktown facility

EXHIBIT V

PolyOne Concentration Database for Vent Gas Absorbers

EXHIBIT V

List of PolyOne Concentration Databases for Vent Gas Absorbers

(submitted in the enclosed CD)

Henry- PVC_CO_CEMS_Monitoring.xls

Henry- PVC_CO-THC-CH4_Monitoring.xls

Henry-PVC_Testing-Emissions_Data.xls

PolyOne Pedricktown PVC_CO_CEMS_Monitoring.xls

PolyOne Pedricktown PVC_CO-THC-CH4_Monitoring.xls

PolyOne Pedricktown PVC_Testing-Emissions_Data.xls

EXHIBIT VI

Generalized Procedure to Evacuate and Service a VCM Filter at a Typical PVC Facility

SCOPE: This procedure describes the steps necessary to evacuate and service the VCM filters.

- Removing from service
- Returning to service

REQUIREMENTS: The poly floor operator is responsible for performing this procedure. Maintenance must wear fresh-air when opening the filter.

Used filter elements must be placed in plastic bags and removed from the poly floor roof and disposed of in the BFI bin.

RELEVANT DOCUMENTS VCM MSDS

DEFINITIONS None

PROCESS EQUIPMENT : VCM Charge Line II VCM Charge Filter RVCM Filters, Virgin VCM Filter

MATERIALS/EQUIPMENT (36) Filter cartridges

SAFETY Hazardous materials are materials that present a health and/or physical hazard. Refer to the attached chemical description which lists the hazardous material, the hazards they present and the controls used to minimize the hazard.

QUALITY This is a quality critical procedure. The filter elements must be installed properly to prevent quality problems.

ENVIRONMENTAL There are environmental regulations associated with the opening of this equipment that must be properly followed throughout this procedure. The filter elements must be disposed of properly to comply with environmental regulations.

PROCEDURE

REMOVING FROM SERVICE

1.0 Approval

1.1 Request the use of the #1 vacuum pump.

1.2 Verify with the DCS operator which filter is to be serviced.

NOTE

The servicing of the VCM charge filters must be coordinated with the DCS operator to ensure reactor charges are not delayed.

1.3 Close and lock the following valves on the filter:
- Inlet valve from charge pump
- Outlet valve to reactor
- Relief valve to LP header valve

1.4 Open the drain valve to the RVCM receivers.

NOTE

By draining off as much liquid VCM as possible to the receivers, evacuation of the filters will be more efficient.

1.5 Close and lock the drain valve when the pressure is equalized between the filter and the RVCM receivers.

2.0 Evacuate the Filter

2.1 Open the upper block valve to the evacuation and purge header.

2.2 Monitor the filter to ensure the pressure is dropping.

2.3 Slowly open the drain valve on the bottom of the filter once a vacuum is established on the filter.

2.4 Close the drain valve.

2.5 Remove the plug from the drain valve at the bottom of the filter.

WARNING

Block valves can leak through causing VCM vapors to build behind plugs. Remove plugs slowly to prevent possible VCM exposure.

2.6 Insert a Chicago coupling into the drain valve.

2.7 Connect a steam hose to the drain valve.

NOTE

The condensate should be blown out of the steam hose before connecting to the filter.

2.8 Slowly open the steam to the filter once a vacuum on the filter is reached.

NOTE

Monitor the filter pressure on the local pressure gauges on the filter. Once the filter housing and the piping are warm, let the filter steam for 5 minutes to ensure the filter is clear of VCM.

2.9 Close the following valves:

- Steam to the filter at the hose station
  - Close and lock upper and lower block valves to the evacuation and purge header

NOTE

Lock sample valve to sample station.

2.10 Disconnect the steam hose from the filter.

WARNING

Ensure that filter is under a vacuum after the steam hose is blocked in. This will ensure that all of the hot condensate has been removed from the hose to prevent serious burns when removing.

2.11 Notify the DCS operator that you are through with the vacuum pump.

3.0 Prepare the Filter for Opening

3.1 Have the DCS operator start up the steam jet.

3.2 Open the block valve on the filter to align the filter to the steam jet.

3.3 Open the drain valve at bottom of filter to pull air through the filter.

NOTE The steam jet should be allowed to pull air through the filter for 2-3 minutes to ensure it is cool enough for maintenance to begin work.

3.4 Close and tag the block valve to the steam jet. Must be able to use valve if necessary - (ex: pressure build up from a valve leaking by, etc.)

3.5 Notify the DCS operator you are finished with the steam jet.

4.0 Open the Filter

4.1 Have maintenance tag lock box.

4.2 Issue permit to maintenance.

WARNING

Maintenance must wear all required PPE (gloves, fresh air) while removing the filter head to prevent exposure to VCM and/or burns from hot piping.

4.3 Collect an opening/loss sample with a MiniRAE meter.

4.4 Record the results on the work permit.

4.5 Allow maintenance to begin replacing elements.

4.6 Inspect the filter elements for damage and general condition.

4.7 Inform the Lead Operator of the condition of the filter elements.

NOTE
Some or all of the elements may be saved to let the technical group inspect.

RETURNING TO SERVICE

1.0 Place Filter Back in Service

1.1 Ensure there is no debris in the filter pot.

1.2 Verify the filter elements stabilizing ring is installed.

1.3 Ensure a new head gasket is installed.

1.4 Have maintenance place the head on the filter and secure.

2.0 Pressure Test the Filter

2.1 Connect an air hose to the drain valve on the bottom of the filter.

2.2 Pressure up the filter to 80 psig with air.

2.3 Block in the air to the filter.

2.4 Soap test for leaks. If OK, have maintenance remove tags from lock box.

WARNING
The filter must be leak tight to prevent employee exposure to VCM vapors, and to prevent any leaks to atmosphere.

3.0 Evacuate the Filter

3.1 Block in the drain valve at the bottom of the filter.

3.2 Disconnect the air hose and install the plug.

3.3 Have the DCS operator start up the steam jet.

3.4 Open the block valve to the steam jet.

CAUTION
Ensure the filter is pulled into a good vacuum to remove any oxygen which would affect product quality and to prevent a reaction between VCM and oxygen.

4.0 Return the Filter to Service

NOTE If the filter shall remain on stand-by, it is left evacuated.

4.1 Unlock and open the valve from the filter outlet to the charge header and remove the tag.

4.2 Unlock and open the filter inlet and remove the tag.

4.3 Align the sample station.

4.4 Notify the DCS operator the filter is back in service (VCM charge filters).

5.0 Perform Housekeeping

5.1 Roll up hoses and store.

5.2 Return the MiniRAE to storage and place on charger.

5.3 Ensure the plugs are in the valves.

5.4 Ensure the filter elements are disposed of properly.

SERVICING RELIEF VALVES

1.0 Prepare to Service the Relief Valve

1.1 Obtain approval from the production superintendent and/or Lead Operator.

1.2 Ensure maintenance is ready.

1.3 Isolate the filter.

1.4 Evacuate the filter.

NOTE Refer to the section "Removing From Service" in this procedure for specific instructions.

2.0 Prepare the filter for Maintenance

2.1 Unlock and close the tagged block valve to the low pressure (LP) header.

2.2 Lock and tag the LP header valve in the closed position.

2.3 Issue permits.

3.0 Inspect the Relief Valve and Rupture Disk

3.1 Compare the tag information on the one removed from service to the one being installed.

- Set pressure/temperature
- Size

3.2 Ensure the relief valve/rupture disk is installed properly:

- Proper type bolts/studs (no all-thread rods)
- Bolts tightened evenly
- Proper type, size, and number of gaskets

4.0 Service the Filter

NOTE
The filter is serviced each time it is evacuated/steamed.

5.0 Pressure

5.1 Connect an air hose to the drain valve on the bottom of the filter.

5.2 Pressure up the filter to 80 psig with air.

5.3 Soap test for leaks.

WARNING

The filter and relief valve assembly must be leak tight to prevent employee exposure to VCM vapors and any leads to the atmosphere. If any leaks are found, vent the pressure and repair the leak(s). Pressure up again and check for leaks.

5.4 Block, bleed, and disconnect the air hose.

5.5 Vent the pressure to the atmosphere.

5.6 Close the drain valve and install plug.

6.0 Align the Relief Valve

6.1 Unlock and open the valve to the LP header.

6.2 Lock and tag the valve in the open position.

Temporary Operation

7.0 Temporary Operation

7.1 When temporary operations are required, the Production Superintendent will develop procedures before they begin. An MOC (Management of Change) will be generated. Training will be conducted and documented.

Emergency Operation

8.0 Emergency Operation

8.1 When emergency operations are required, the Production Superintendent will coordinate with the Lead Operator on duty. Training will be conducted and documented at the time of the emergency.

Emergency Shutdown

9.0 Emergency Shutdown 9.1 Block in inlet, outlet, and all bleed valves.

CONSEQUENCES OF DEVIATION AND STEPS TO RECOVER

Procedure Step	Problem Description	Consequence of Deviation	System Response	Tag Number	Steps to Recover
2.10	Failure to ensure filter is under a vacuum after steam hose blocked in	Operator could be potentially sprayed with hot condensate resulting in burns	None	N/A	Repeat training, monitor vacuum before disconnecting steam hose
2.4, 5.3	Failure to soap test for leaks	Potential employee exposure to leaking VCM vapors, potential reportable release	Area GC monitors, LEL detection system	N/A	Tighten bolts if leaking gasket, or shutdown, evacuate, and make repairs

Rev. #	Change	Training Required Yes/No
0	Initial issue.	Yes
1	Added third bullet to step 1.3. Replaced the word tag with lock. Added note after step 2.9. Revised step 3.4. Added steps 7.0, 8.0 & 9.0.	Yes

REVISIONS/TRAINING TABLE

VINYL CHLORIDE MONOMER (VCM)

DESCRIPTION: A colorless, sweet smelling gas at atmospheric pressure and room temperature.

PROPERTIES: Flammable and toxic. Cancer suspect agent.

HAZARDS: Harmful if inhaled. Causes thermal burns. Rapid evaporation of the liquid causes frostbite to skin and eyes.

SYMPTOMS: Loss of sensation, state of stupor, and loss of consciousness. PPE:

Refer to PPE Sampling Matrix for specific PPE, required when sampling. Airline respirator, chem-proof gloves and rubber boots. Splash suit if possible danger of splash.

CONTROL: In the event of a leak, eliminate ignition sources, notify the supervisor, and stop or control the leak if it can be achieved without undue risk. Use water spray to disperse vapors and protect personnel.

FIRST AID: Eyes: Immediately flush eyes with water for 15 minutes. Forcibly hold eyelids apart to ensure irrigation of all eye and lid tissue. Seek medical attention.

Skin: If direct liquid contact occurs, flush with water. If frostbite or burn occurs, do not rub the area. Get immediate medical attention.

Inhalation: Move victim to fresh air. Apply appropriate first aid treatment as necessary. Get immediate medical attention.

Ingestion: N/A

REFER TO THE MSDS FOR ADDITIONAL INFORMATION

EXHIBIT VII

PVC MACT Working Group Analysis of Initial and Monthly Compliance with Car Seal Inspection Requirements

Operational Actions to Comply with EPA's PVC MACT Bypass Provisions

Operational Actions to Comply with EPA's PVC MACT Bypass Provisions

Notes:

1. Since there are no bypass exemptions, any component within the closed vent system (CVS) that could cause a HAP-containing gas stream to be diverted away from the control device and then be discharged to the atmosphere must have a bypass indicator (i.e., flow indicator & alarm; or, a car-seal/lock & key mechanism), including any of the following no matter what size (e.g., ½ in valve on a drain):
   a. Low leg drains;
   b. High point bleeds;
   c. Valves on open ended lines;
   d. Pressure relief devices; and,
   e. Analyzer vents.
2. Since there is no clear exemption for equipment that has met the PVC MACT equipment opening requirements; any HAP release event must be considered, including:
   a. Any remaining fugitive HAP gases after the equipment opening emission standard at 40 CFR 63.11955 has been met; and,
   b. Vapor collection systems from miscellaneous vents (e.g., loading lines)
   c. Exhaust gas from analyzer vents, such as a ambient air monitoring system required by 40 CFR 63.11956
3. In addition, consideration must be made to any bypass that could "cause air intrusion into the control device" (40 CFR 63.11930(g)(1)); for example:
   a. Manway hatch on a CVS Knockout pot
4. Burden to comply with the Bypass provisions is considered an independent burden from the CVS Inspection and Monitoring requirements (e.g., initial inspection using EPA Method 21 monitoring procedures; and, annual audio, visual, olfactory (AVO) inspection thereafter).

Summary of Actions Required in Order to Comply:

Action #1: Identifying affected Closed Vent System (CVS) equipment and potential bypasses prior to installing Bypass indicators

Action #2: Develop and implement procedures to prevent/minimize bypass "violations" and certify compliance including:

1. Ensuring bypass indictor changes are tracked (e.g., flow indictors alarms, car seal is broken);
2. Required actions are performed (e.g., if alarm is triggered; identify the cause); and,
3. Required records and reports are maintained and retained; including potential release events.

Action #3: Develop and implement Added/ Removed Car-Seal Tracking Procedures and other data Quality Assurance/Quality Control (QA/QC) checks

Action #4: Conduct Bypass Training

Specific Details Follow Below

Action #1: Identifying affected Closed Vent System (CVS) equipment prior to bypass indicator installation, which includes the following steps:

Step 1.1: Determining Regulatory Applicability:
Determine if there are any other regulatory overlaps with the PVC MACT (e.g., CVS is shared with HON regulated Unit; State-required CVS special conditions)

Step 1.2: P&ID Review and Speciation
The Operations Department and the Environmental Department review P&IDs to determine which CVS Bypass components are "in HAP service," and which are reasonably expected not to be exceed 5% wt. HAPs.

Step 1.3: Field Verify
The Operations Department, combined with the efforts of the Environmental Department, will field verify the location of the CVS Bypass equipment and confirm existing speciation of chemicals that could be diverted through the bypass component.

Step 1.4: Install Bypass flow indicator or hang Car-seal
The Operations Department will install the bypass indicator equipment, which may entail the need to rent a lift to raise personnel up to a bypass valve; shut down of equipment that is unsafe to work on (e.g., too hot; under construction scaffolding); obtain safety permits, etc.

Step 1.5: Establish database/log sheet of affected bypass equipment
Data elements necessary for finding and inspecting regulated components include some of the following, using a car-seal example:

- Unit
- Process Area
- Equipment
- Car Seal Number
- Component Type (e.g. valve, pressure relief device, etc.)
- Size
- Service Type
- Applicable Rule (if overlap; determine which supersedes)
- Location Description
- Accessibility (difficult to monitor?, unsafe to monitor?)
- Process Stream Identification
- Process and Identification Drawing (P&ID) Number
- Safety equipment necessary to perform inspections

Action #2: Develop and implement procedures for:

1. Ensuring bypass indictor changes are tracked (e.g., flow indictors alarms, car seal is broken);
2. Required actions are performed (e.g., if alarm is triggered; identify the cause); and,
3. Required records and reports maintained and retained; including potential release events and CVS leak repairs.

ASSUME CAR-SEALS ARE INSTALLED:

Step 2.1: Visually inspect car seal monthly:

- Develop and implement inspection route & inspection forms
- Complete inspection to determine if car seal is still in place (e.g., did not fall off due to deterioration) or broken due to discharge through the valve; and/or, replaced with new Car-Seal mechanism/ID number.

Record:

- Date,
- Car Seal number
- Inspection results, including bypass valve position.

Step 2.2: If opening a car-sealed bypass for any reason:
Complete Car seal tracking form: Record date, time, Car seal number and if emissions occurred.
If emissions occurred: Record the following information:

- Date and time the bypass was opened/closed;
- The duration of the flow in the bypass;
- Records of the times of all periods when the vent stream is diverted from the control device or the flow indicator is not operating;
- Complete emission estimations; and,
- Because Event is considered a violation: Follow PVC MACT "Affirmative Defense" provisions, with a "preponderance of evidence" to support valve change is not a "violation" (see 63.11930(c)(2)(ii) and 63.11895).

Step 2.3: Records & Reporting

Report:

- Semi-annually within PVC MACT Report: Each instance for which a bypass valve is changed to the diverting position.
- Other Repotting mechanisms (e.g., Semi-Annual Title V Deviations Report; annual Emissions Inventory, etc.)

Action #3: Develop and implement Added/ Removed Car-Seal Tracking Procedures needed to ensure that covered equipment added to/ removed from the Unit for any reason is integrated into the Car-Seal inspection and reporting program

Step 3.1: Rectify Car Seal Numbers

- Car seal numbers on the monthly inspection sheet need to match up with the car seal numbers in the field.
- During a turnaround or complex maintenance event; numerous maintenance-type valves, like low-leg drains, will be opened.
- As such, new car seals are installed; the old car seal number needs to be retired from the inspection sheets and a new car seal number inserted.
- Rectifying car seal numbers may take considerable effort if 100-200 maintenance-type bypass valves are open during a major turnaround.

Action #4: Bypass Training – Procedures and training protocols are needed to describe actions to be taken if a bypass release occurs; what to look for during car-seal inspections, etc.

Step 4.1 By Pass Training: Since monthly inspections are needed; car seals number tracked; broken car seals replace, compliance certifications required, etc. in order to prevent "violations," training on the issue needs to be provided to the following personnel:

- Operations Department;
- Maintenance Department;
- Instrumentation Department;
- Contractors; and,
- Environmental Department.

Step 4.2: Compliance certifications: Due to the specific PVC MACT requirements to certify compliance (e.g., 40 CFR 63.11985(a)(9)), the following types of personnel also need to be trained on the requirements:

- The Responsible Official;
- Site Managers; and/or
- Vice Presidents/ General Managers

Bypass Burden Cost Estimate: PVC MACT

6.7.12

By Pass Labor Burden Cost Estimate: PVC MACT

Actions	Initial	Annual
Step 1.1 Determine Regulatory Applicability		
Assume: 2 Eng. 4 hrs	$ 664.08	
Step 1.2: P&ID Review and Speciation		
Assume: 2 Eng for 24 hr	$ 3,984.48	
Step 1.3: Field Verify		
Assume: 2 Eng for 24 hr & 1 Op. for 24 hr	$ 5,129.52	
Step 1.4: Install Bypass flow Indicator or hang Car-seal		
Assume: 2 Op. for 20 min/bypass	$ 11,132.33	
Step 1.5: Establish database/log sheet of affected bypass equipment		
Assume 1 Eng for 40 hr	$ 3,320.40	
Step 2.1: Visually inspect car seal monthly:		
Assume Polyolefins Inspection Rate by Op.: 7 min/bypass		$ 23,377.90
Step 2.2: Actions if opening a car-sealed bypass (Violation: must investigate & develop corrective actions):		
Assume 1 Op. 1 Eng & 1 Mgr 1 hr/event		$ 733,265.92
Step 2.3: Records & Reporting		
Assume 1 Eng & 1 Mgr 2 hr/month		$ 4,905.36
Step 3.1: Rectify Car Seal Numbers		
Assume 1 Eng for 2 hr/month		$ 1,992.24
Step 4.1 By Pass Training:		
All Operations & Env. Employees (assume 50) 2 hr initial	$ 4,771.00	
Responsible Official/Site Managers, (assume 3) for 30 min initial	$ 182.07	
Total per PVC Unit:	**$ 29,184**	**$ 763,541**
Total all 15 major & 2 area PVC Units	**$ 496,126**	**$ 12,980,204**
Annual Cost Per Bypass		**$ 2,182**

Hourly Rates (from EPA's Air Poll. Control Cost Manual):

Operator/Supervisor	$ 47.71
Process/Env. Engineer/Tech	$ 83.01
Management	$ 121.38
	Example PVC Unit:
Number of Car Sealed bypasses	350
Number of Car Seals broken in a year	
1. Reactor Opening (assume 4 Reactors)	
Four Bypass valves open daily/ Reactor	5840
2. Maintenance Valves in non T/A Year	200
Total:	6040

VOC tpy release*	TPY VOC
Small Equipment	2
Large Equipment	1.4
Total per Unit:	**3.4**
Total MSS all 17 PVC Units:	57.8
*MSS Calc for a suspension PVC Unit -	
assume residual emitted from bypass is 10%	
of total emitted	
Total Fugitive HAPs Emitted	
from Maintenance Bypasses by all PVC Units	5.78
Cost Effectiveness ($/ton VOC)	$ 2,245,710
Potential Penalty/ Violation	$37,500

T/A= Turnaround

MSS = Maintenance, Startup, Shutdown emissions

EXHIBIT VIII

Cost-Benefit Analysis for Release Indicators

EXHIBIT VIIIa

Westlake Cost Estimates from Honeywell

AWC

Customer Details		Quotation	
Name :	Allen Bodron	Quotation Date :	03/15/2012
Company :	Westlake Chemical		
Address :		Quote From :	Randy Hamilton
Tel :		Reference :	
Fax :			

Subject: XYR6000 (Pressure Transmitter Option)

Dear Allen,

This is budgetary quote per your request. This proposal at this time does not reflect project pricing or bundling of items in starter kit fashion to save cost. Two WDM and two FDAT are quoted to reflect redundancy aspect you are trying to achieve. Release 210 will have redundancy already integrated and this will be released end of this year. The fastest scan time available with this solution is 1 sec with this wireless technology. If you have any questions pleas feel free to call.

Regards,

Randy Hamilton
Account Manager

Pos	Qty	Description	Unit Price	Total
1	2	WDMS-00-KD-000-00 OneWireless Device Manager OneWireless Network R200 Documentation Kit	$ 4,298.00 	$ 8596.00
2	2	FDAP2-F6SA00-F6SA00-WM-DD-0000 OneWireless Field Device Access Point with Class 1 Div 2 certification DSSS Ant. 1Opt.: 6 dBi Integral Omni DSSS Ant. 1Opt.:with Integral Lightning Surge Arrestor DSSS Ant. 1Opt.:No Cable DSSS Ant. 2 Opt.: 6 dBi Integral Omni DSSS Ant. 2 Opt.:with Integral Lightning Surge Arrestor DSSS Ant. 2 Opt.:No Cable Wall mount kit OneWireless Network R200 Electronic Documentation on CD	$ 3,444.00 	$ 6888.00
3	50	STGW94L-E1A-00000-R0000-XF,BA,1C-NA00 XYR 6000 Wireless Transmitter In-Line Gage & Absolute Pressure Series 900 Gage pressure : 0-20 to 0-500 psig/0-1.4 to 0-35 bar 316 SS wetted process head, 316L SS barrier diaphragms Silicone fill fluid Process connection configuration : 9/16" - 18 Aminco Integral Right-angle, vertical 4 dBi None None 2.4 GHz Frequency Hopping Spread Spectrum (FHSS) Battery FM IS, Explosion proof, non incendive, non sparking North America,Canada	$ 3,164.00 	$158200.00
4	1	Dolphin Handheld for Downloading Keys	$ 1700.00	$ 1700.00

AWC

Customer Details		Quotation	
Name :	Allen Bodron	Quotation Date :	03/15/2012
Company :	Westlake Chemical		
Address :		Quote From :	Randy Hamilton
Tel :		Reference :	
Fax :			

Subject: XYR6000 (Digital Input Option)

Dear Allen,

This is budgetary quote per your request. This proposal at this time does not reflect project pricing or bundling of items in starter kit fashion to save cost. Two WDM and two FDAT are quoted to reflect redundancy aspect you are trying to achieve. Release 210 will have redundancy already integrated and this will be released end of this year. The fastest scan time available with this solution is 1 sec with this wireless technology. If you have any questions pleas feel free to call.

Regards,

Randy Hamilton
Account Manager

Pos	Qty	Description	Unit Price	Total
1	2	WDMS-00-KD-000-00 OneWireless Device Manager OneWireless Network R200 Documentation Kit	$ 4,298.00 	$ 8596.00
2	2	FDAP2-F6SA00-F6SA00-WM-DD-0000 OneWireless Field Device Access Point with Class 1 Div 2 certification DSSS Ant. 1Opt.: 6 dBi Integral Omni DSSS Ant. 1Opt.:with Integral Lightning Surge Arrestor DSSS Ant. 1Opt.:No Cable DSSS Ant. 2 Opt.: 6 dBi Integral Omni DSSS Ant. 2 Opt.:with Integral Lightning Surge Arrestor DSSS Ant. 2 Opt.:No Cable Wall mount kit OneWireless Network R200 Electronic Documentation on CD	$ 3,444.00 	$ 6888.00
3	50	STXW500-000-0000-R0000-XF,BA,TG,SB,1C-EU00 XYR 6000 Wireless Multi Discrete Input Transmitter Series 500 Wireless Transmitter with Three Discrete Inputs Integral Right-angle, vertical, 4dBi 2.4 GHz Frequency Hopping Spread Spectrum (FHSS) Battery Stainless Steel Customer Wired-On Tag Mounting Bracket - 304 SS FM,IS,Explosion-proof,Nonincendive,Non-Sparking For use in European Union	$ 2,600.00 	$130,000.00
4	50	Fike BDI (Burst Disk Indicator)	$ 250.00	$ 12,500.00
5	1	Dolphin Handheld for Downloading Keys	$ 1700.00	$ 1700.00

EXHIBIT VIIIb

Westlake Cost Estimates from Champion Technology Services

From: "Mehrdad Ghorashi" <Mehrdad.Ghorashi@champtechnology.com>
To: "Bodron, Allen" <abodron@westlake.com>
Sent: Monday, March 26, 2012 10:28 AM
Subject: EPA OPC Data Integration to Honeywell

Allen,

Per our discussion, I have the following scope captured:

1) Establish OPC Connectivity to Data Server
2) Build of 50 OPC Points to the Honeywell SCADA
3) One (1) tabular graphic showing all data points

If the OPC server is remote to your Honeywell servers, I recommend purchasing and installing Honeywell's OPC tunneller (~$2,400) to make the connection to the remote OPC server so you don't have to compromise the security settings of the Honeywell servers..

Here is the cost breakdown:

1) Services - $4,400 (T&M @$110/hr)
    a. Install necessary software
    b. Build Channel and Controller for OPC data
    c. Build 50 EPA Quickbuilder points
    d. Develop 1 graphic displaying data points

2) Software – OPC Tunneller - $2,400

Total cost = $6,800

Feel free to call me with any questions or comments.

Thanks,

Mehrdad Ghorashi
Business Manager
Champion Technology Services, Inc.
17991 Old Perkins Rd. East, Suite E **Please note new office address and phone number**
Baton Rouge, LA 70809
Office: 225-615-8120
Cell: 225-802-2179
Fax: 225-612-6394
email: Mehrdad.ghorashi@champtechnology.com
www.champtechnology.com

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EXHIBIT VIIIc

Dow Chemical Corporation Cost Estimates for Wired PSV System

Dow Chemical Corporation Cost Estimate for Wired PSV System With Installation of an Additional Junction Box

Project Cost Estimate Summary Report

Global Project Controls — Rev. 1.30

Dow Site	Louisiana Operations	Date	February 29, 2012
Project Name	PSV Switch Installation	Cost Eng.	M. Dugas
Project No./Auth.No.		Proj.Mngr.	Don Eure
Auth. Date	April 1, 2012	Proj.Eng.	
RTO Date	May 1, 2012	Plant	

Section	Code	Item	Manhrs / %	Labor	Material	Total
Dow Furnished Material						
	3000	Civil/Steel				
	4000	Piping Materials				
	6000	Instruments				$4,142
	7000	Electrical				
	8000	Local Orders	0.0% of DFM			
	9000	Major Equipment	0.0% included for spare parts			
		DFM total				$4,142
Contracts			Manhrs	Labor	Material	
		Major Equipment				
		Civil				
		Steel				
		Piping				
		Instrumentation	37	$2,062	$253	$2,315
		Electrical	123	$7,244	$1,315	$8,559
		Insulation				
		Paint				
		Scaffolding		$900		$900
		Demolition				
		Equipment Rental			$2,048	$2,048
		Overtime Premium				
		Winter Work (Labor Only)				
	1000	Contracts total	160			$13,822
Indirects			% of estimate			
	2100	Project Management	2.5%			$872
	2200	Process Engineering				
	2300	Process Control Engineering				
	2400	Design Engineering	14.2%			$4,920
	2500	Procurement	0.3%			$109
	2600	Construction Management	5.0%			$1,736
	2700	Business Direct Engineering				
	2800	Outside Engineering				
	2900	Miscellaneous	3.8%			$1,326
		Indirects total	25.9%			$8,964
Special Items						
	3100	Taxes & Fees	9.0%			$698
	3200	Inspection & Testing				
	8600	Freight	1.0%			$57
		Special Items total				$755
Subtotal		Direct, Indirect and Special Items				$27,683
	3700	Contingency			24.8%	$6,860
	3800	Cost Trend			03.0% /yr	
Total						$34,543
	669000	Capitalized Interest			06.6% /yr	$457
Amount Requested for Capital					$USD	$35,000
		Exchange Rate:			$ US	
		Expense Cost				$2,833
Total Expense						$2,833

Estimate Accuracy - Planning			
Range high +	35%	$USD	$47,250
low -	25%	$USD	$26,250
Estimate Probability	60%	CEI	5.62

Signatures

Project Eng.________________ Date____________ Project Manager________________ Date____________

EXHIBIT VIIIc
List of Calculation Spreadsheets for Dow Chemical Corporation
Cost Estimate for Wired PSV System
With Installation of an Additional Junction Box

(submitted in the enclosed CD)

PSV Switch Installation Summary.xlsx

Dow Chemical Corporation Cost Estimate for Wired PSV System Without Installation of an Additional Junction Box

Project Cost Estimate Summary Report

Global Project Controls

Rev. 1.30

Dow Site	Louisiana Operations	Date	February 29, 2012
Project Name	PSV Switch Installation	Cost Eng.	M. Dugas
Project No./Auth.No.		Proj.Mngr.	Don Eure
Auth. Date	April 1, 2012	Proj.Eng.	
RTO Date	May 1, 2012	Plant	

Dow Furnished Material					
3000	Civil/Steel				
4000	Piping Materials				
6000	Instruments				$540
7000	Electrical				
8000	Local Orders	0.0% of DFM			
9000	Major Equipment	0.0% included for spare parts			
	DFM total				$540
Contracts		Manhrs	Labor	Material	
	Major Equipment				
	Civil				
	Steel				
	Piping				
	Instrumentation	21	$1,165	$185	$1,350
	Electrical	68	$4,041	$932	$4,973
	Insulation				
	Paint				
	Scaffolding		$900		$900
	Demolition				
	Equipment Rental			$1,146	$1,146
	Overtime Premium				
	Winter Work (Labor Only)				
1000	Contracts total	89			$8,369
Indirects		% of estimate			
2100	Project Management	4.7%			$872
2200	Process Engineering				
2300	Process Control Engineering				
2400	Design Engineering	13.4%			$2,521
2500	Procurement	0.6%			$109
2600	Construction Management	5.5%			$1,033
2700	Business Direct Engineering				
2800	Outside Engineering				
2900	Miscellaneous	4.6%			$871
	Indirects total	28.8%			$5,407
Special Items					
3100	Taxes & Fees	9.0%			$252
3200	Inspection & Testing				
8600	Freight	1.0%			$17
	Special Items total				$269
Subtotal	Direct, Indirect and Special Items				$14,585
3700	Contingency			28.6%	$4,174
3800	Cost Trend			03.0% /yr	
Total					$18,759
669000	Capitalized Interest			06.6% /yr	$241
Amount Requested for Capital				$USD	$19,000
	Exchange Rate:			$ US	
	Expense Cost				$2,833
Total Expense					$2,833

Estimate Accuracy - Planning			
Range high +	35%	$USD	$25,650
low -	25%	$USD	$14,250
Estimate Probability	60%	CEI	10.52

Signatures

Project Eng.________________ Date____________ Project Manager________________ Date____________

EXHIBIT VIIIc
List of Calculation Spreadsheets for Dow Chemical Corporation
Cost Estimate for Wired PSV System
Without Installation of an Additional Junction Box
(submitted in the enclosed CD)

PSV Switch Installation Summary no JB.xls