MATSON & ASSOCIATES

Matson & Associates Inc • 331 East Foster Avenue • State College, Pennsylvania 16801

January 2008

Mr. Charles McPhedran
PennFuture
1518 Walnut Street, Suite 1100
Philadelphia, PA 19102

Re: Collegeville TCE matter

Dear Mr. McPhedran:

Enclosed please find Matson & Associates, Inc's preliminary report concerning methods for reducing TCE emissions at Accellent, Inc and Superior Tube Company, Inc located in Collegeville, Pennsylvania.

Please feel free to contact me if you have any questions or need additional information.

Regards,

Wendy N. Pearson
Senior Project Manager

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Preliminary Report

Methods for Reducing TCE Emissions at Accellent, Inc. and Superior Tube Co., Inc. Collegeville, Pennsylvania

Prepared for:

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SUMMARY

Superior Tube, Company Inc (Superior Tube) and Accellent, Inc. (Accellent), two narrow tube companies in the Collegeville, PA, were ranked #6 and #8 respectively, for TCE emissions in the United States in 2005. Matson & Associates, Inc. (M&A) was asked to analyze the sources of toxic TCE emissions from the two facilities and provide recommendations on ways in which these companies can reduce their TCE emissions. Pursuant to this request, M&A has identified the following three methods that when implemented, in some combination, by Superior Tube and Accellent with significantly reduce TCE emissions at their Collegeville, PA plants:

(1) Route emissions from equipment emitting significant levels of TCE to effective activated carbon (AC) systems;

(2) Install closed-loop, vacuum, or airless vacuum vapor degreasers in place of equipment currently being used to perform degreasing operations.

(3) Switch from TCE to a non-HAP formula (e.g. n-propyl bromide) in equipment currently employing TCE;

Items (1) and (2) are feasible for reducing emissions from both large and small emitters of TCE. Item (3) is best employed for small emitters. nPB is a volatile organic compound (VOC) though it is not classified as a hazardous air pollutant (HAP), as is TCE. As a VOC, it does present some safety and environmental concerns such that its release in large quantities is not desirable.

Recommendations for Superior Tube:

- Employ items (1) or (2) to minimize the uncontrolled emissions from the three largest sources of TCE: Lubrication Dip Tank #1205, Lubrication Spray Booth #6779, and Solvent Cleaner Tank #1369. These pieces of equipment emitted 14.0, 10.5, and 13.7 tons of TCE, respectively in 2004. Routing these sources to AC or replacing with a closed-loop, vacuum, or airless vacuum vapor degreaser will reduce facility wide emissions by approximately 70%, based on 2004 estimates.

- Conduct a new compliance test on its current AC system and have its permit limits for Vapor Degreaser 661 adjusted to reflect the test results. An analysis of Superior Tube's data indicated emissions of the AC system over the last several years are excessive in comparison to the emissions based on capture efficiency demonstrated in the 2001 compliance test.

- Implement a combination of items (1), (2) or (3) on the remaining sources of TCE emissions. These pieces of equipment individually have lower TCE emissions; however, their cumulative contributions to facility wide emissions are significant.

- Install continuous monitoring devices to measure TCE concentrations in the exhausts of degreasing equipment and AC systems. This monitoring will allow for automated alerts and controls that will result in decreased emissions, and

would provide the public and regulatory agencies with information to ensure that Superior Tube is operating its emissions controls within specifications.

Recommendations for Accellent:

- Conduct a compliance test on the new AC system to determine its TCE capture efficiency and have its permit limits for Plant #1 and Plant #2 Vapor Degreasers adjusted to reflect actual test results. Accellent is proposing only a 25-35% reduction in facility wide TCE emissions, but will be able to achieve at least a 90% reduction with a properly operating AC system.

- Implement a combination of items (1), (2) or (3) on the remaining sources of TCE emissions. These pieces of equipment (Fabrication Vapor Degreaser, Plastic Coater) individually have much lower TCE emissions than the two Vapor Degreasers; however, reducing TCE emissions from all equipment is important.

- Install continuous monitoring devices to measure TCE concentrations in the exhausts of degreasing equipment and AC systems. This would allow for automated alerts and controls that will result in decreased emissions, and will provide the public and regulatory agencies with information to ensure that Accellent is operating its emissions controls to minimize emissions of this HAP.

The timing for implementing these recommendations at both Superior Tube and Accellent should be one year or less for items (1) and (3) and eighteen months or less for item (2). The installation of continuous monitoring devices would occur at the same time the modifications are being made. The recommendations and associated timeline are based on DEP public records for each company, peer-reviewed literature, vendor information and our engineering knowledge. M&A may revise these recommendations if given the opportunity to visit the plants and obtain additional engineering information.

METHODS FOR REDUCING TCE EMISSIONS

(1) Activated Carbon

Description

Activated carbon (AC) is a versatile, proven, and cost effective pollution control technology. It has been employed for many years in TCE-removal applications for both air and water purification. As a TCE-contaminated air or water stream passes through AC bed, the TCE is adsorbed (captured), allowing only trace quantities of TCE to pass through. The adsorbed TCE is removed from the AC bed using steam. The steam/TCE mixture is sent to a condenser and then to a settling tank, where the TCE separates from the water phase and is returned to the manufacturing process after some minor polishing. By facilitating the recycling of used TCE, AC systems result in cost savings on virgin solvent purchases in addition to much lower TCE emission rates. This is the current state of the art technology.

Current Use of AC Systems in the Narrow Tube Industry

Accellent

In April 2007, Accellent submitted an application for an AC system comprised of four beds. This system will be an excellent first step in reducing TCE emissions at its facility. These beds will only serve two of the four TCE emissions sources. The two sources being routed to the system are responsible for approximately 95% of its 2006 plant-wide emissions[1], yet Accellent has proposed only a 25-35% reduction in TCE emissions from the installation of the AC system[2]. The proposed reduction efficiency is much too conservative. If designed and operated properly, the AC system will be capable of eliminating almost all emissions from these two sources, resulting in a net reduction in TCE emissions of at least 90%.

Accellent should perform compliance tests on the new AC system, at actual TCE throughputs, to determine the systems actual capture efficiency. DEP should adjust the AC permit to more accurately reflect the annual emissions that Accellent is capable of achieving. Similar actions should be replicated after every expansion / installation of additional AC capacity.

Superior Tube

Superior Tube currently operates an AC system to control and recover TCE emitted from only one source: Vapor Degreaser #661 (VD661). The AC system was installed in late 2001. It is comprised of three carbon beds such that two beds will be in-service, while the third is either regenerated or idle.

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[1] See Appendix A for TCE Emissions Inventory for Accellent

[2] Accellent, 4/5/07. Letter to DEP Re: Request for Determination – Voluntary installation of Carbon Adsorption System on two large degreasers to reduce TCE emissions.

In 2004, plant-wide TCE emissions from Superior Tube totaled approximately 77 tons based on a 12 month rolling average[3]. Since then, three sources of TCE emissions have been eliminated or are proposed to be eliminated in 2007. The sources comprising the rest of the 2004 plant-wide TCE emissions (52.5 tons), roughly 68%, have no emissions controls either planned or in place. Furthermore, Superior Tube is proposing an additional 6 tons of uncontrolled TCE emissions from its Flush & Blow Booths.

Three of Superior Tube's uncontrolled emissions sources– the Lubrication Dip Tank #1205, Lubrication Spray Booth #6779, and Solvent Cleaner Tank #1369 – accounted for 14.0, 10.5, and 13.7 tons of Superior Tube's 2004 TCE emissions, respectively (based on 12 month rolling averages)[4]. Routing these sources to AC is one method of reducing facility-wide emissions by around approximately 70% based on 2004 numbers.

<u>Analysis of Superior Tube's AC system for controlling TCE emissions from VD661</u>

In Superior Tube's November 20, 2000 permit application for a new AC system, the estimated overall TCE capture efficiency was 81%. Based on this value, and a conservative estimate of pre-controlled emissions from VD661, Superior Tube requested and received a permit to emit 20.6 tons of TCE from VD661 annually. Roughly one year later, Superior Tube conducted compliance tests on its newly installed AC system. The tests showed Superior Tube's AC system had an average TCE removal efficiency of 99.2%[5].

Table 2, below, depicts the large contrast in estimated TCE emissions from VD661 at the different capture efficiencies.

Table 1. Calculated controlled TCE emissions for each capture efficiency

Hourly Pre-controlled TCE Emissions lb/hr	Calculated Controlled TCE emissions, tons/year*	
	81% capture efficiency	99.2% capture efficiency
23.0[(a)]	19	0.8
14.8[(a)]	12	0.5
8.0[(b)]	6.6	0.3

*Annual emissions are based on the assumption that VD661 was operated 24/7 for the entire year (8760 hrs). Actual emissions from VD661 may be lower than these values.
[(a)]DEP, 1/26/2001. Plan Approval for the Installation of a Carbon Adsorption System, Superior Tube, Co. [(b)]DEP, 1/17/2005 Inspection Report of Superior Tube; DEP, 5/1/2007 Inspection Report of Superior Tube

This table also shows how estimated emissions from VD661 varied with the precontrolled emissions flow rates. While determining the emissions cap in its permit application to the DEP, Superior Tube used the most conservative estimate for maximum hourly pre-controlled emissions from VD661, 23 lb/hr, which was 10% higher than the

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3 See Appendix A for TCE Emissions Inventory for Superior Tube
4 *Id.*
5 Carbon Unit Compliance Testing: Superior Tube, Collegeville, PA, Test Report. January 2002.

single highest valued measured during the AC system compliance test (completed in 2001). The values of 14.8 lb/hr and 8.0 lb/hr represent the average measured during the compliance test, and the actual average from VD661 since 2004, respectively.

The actual annual TCE emissions from the AC system stack (connected to VD661) for the years 2002 to 2004 are shown in Table 3. When compared to the values in Table 2, it is evident that Superior Tube was not operating its AC system at, or even near, the 99.2% capture efficiency demonstrated in the 2001 compliance tests. For example, in 2004 and 2006, controlled emissions from VD661 exceeded what would have been achieved if the system were operating at a capture efficiency of only 81%.

Table 2. TCE emissions from the AC system stack VD661 based on 12 month rolling averages.

Year	Actual TCE emissions, tons/year
2002	6.9*
2003	6.60
2004	7.17
2006	9.65

* VD661 was operated only 3400 hours in 2002
** No data available for 2005 analysis

This comparison indicates two possibilities as to how Superior Tube operated its AC system in 2004: it was bypassing its AC system and/or failing to regenerate its AC beds at the proper frequency, resulting in reduced capture efficiency. The potential for the first situation was noted by DEP inspector Mr. Jim Rebarchak in a 2005 inspection of the Superior Tube facility. During his inspection, Mr. Rebarchak noticed "that there were two bypasses built into the ductwork [of the #661/AC system area]."[6] These bypasses were the original VD661 exhausts that had been in place before the installation of the AC system. When the AC system was installed, a new exhaust was added to feed the AC beds; however, the original exhausts were kept in place "to serve as bypass exhausts in the event of any process upset conditions."[7]

Mr. Rebarchak commented further on these bypasses, saying that "they were both closed, but we were concerned because [there] are no permit conditions limiting their use."[10] (Note: M&A does not have access to the specific operating information regarding the AC unit, i.e. quantity of activated carbon, period of regeneration, recovery efficiency, etc… and therefore cannot determine whether or not the AC system is being operated properly).

[6] DEP 1/26/05. Inspection Report of Superior Tube Co.
[7] iES Engineers, Inc.: "Plan Approval Application To Install An Activated Carbon Adsorption System For Solvent Recovery," iES Project No. 276.0008, November 20, 2000

Superior Tube was granted permits for significantly higher TCE emissions than necessary, given its use of activated carbon to control emissions from vapor degreaser #661. The bottom line is that permitting overly conservative TCE removal efficiencies has allowed the company to emit significantly higher amounts; and actually gives them incentive to do so.

Superior Tube should conduct an updated compliance test on its AC system, to be certain that the system can achieve a capture efficiency of approximately 99% or better, and DEP should adjust the VD661/AC permit to more accurately reflect the annual emissions that Superior Tube is capable of achieving. Similar actions should be replicated after every expansion / installation of additional AC capacity.

(2) Closed Loop, Vacuum, and Airless Vacuum Vapor Degreasers

Description

Both Superior Tube and Accellent use open top vapor degreasers (OTVDs) that have been banned throughout much of Europe[8]. OTVDs, by design, emit large quantities of solvent vapor that either leaves the facility as uncontrolled exhausts to the atmosphere or is captured/destroyed using various forms of pollution abatement technologies (e.g. carbon adsorption). Closed loop, vacuum, and airless vacuum vapor degreasers allow for "reduced air emissions, and reduced solvent purchase, hazardous wasted disposal, and labor costs"[7]. TCE emissions can be controlled up to 97%[9]. In addition, they are more modern vapor degreasers that provide better cleaning, and hence better quality products, than OTVDs.

Current Use of Vacuum Degreaser in the Narrow Tube Industry

Salem Tube, Inc (Salem) is a narrow tube manufacturer in Greenville, PA. In May, 2007, Salem submitted a Plan Approval Application to the DEP for the installation of a new vacuum degreasing line at its facility[10]. The proposed degreaser is about fifty feet long, capable of handling narrow tubes between 4 and 44 feet in length. The DEP has indicated this new vacuum degreaser will be used for a majority of the narrow tubes made by Salem[11]. The installation of a closed system for processing most of Salem's tubes will allow the achievement of a significant reduction in emissions.

Superior Tube and Accellent operate degreasing equipment of various sizes and functions at their respective facilities. Closed loop, vacuum, and airless vacuum vapor degreasers may be used in place of certain equipment currently releasing uncontrolled emissions of TCE.

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[8] NEWMOA 12/28/2001. Pollution Prevention Technology Profile: Closed Loop Vapor Degreasing.
[9] Id.
[10] DEP, no date. Plan Approval for the construction a Trichloroethylene (TCE) Vacuum Cleaning and Degreasing Machine at Salem Tube Inc. /Greenville Reynolds Industrial Park.
[11] Personal Communication with DEP Northwest Region Air Program Manager, 9/2007.

(3) Non-HAP Substitution

Product Availability

n-Propyl Bromide (nPB) is a volatile organic compound (VOC) currently employed as a substitute for halogenated solvents and ozone depleting substances in solvent cleaning (e.g. vapor degreasing, cold cleaning). Table 1 provides a list of vendors that market nPB and some relevant applications of their products.

Table 3. Vendors, brand names and applications of nPB compounds

Vendors of n-Propyl Bromide	Brand Name Products	Applications
Albemarle Corporation	Abzol	"ABZOL cleaners are high-performance precision cleaning solvents for vapor degreasing, cold cleaning and ultrasonic cleaning"
Enviro Tech International	Ensolv	"EnSolv solvents are direct replacements for Trichloroethylene, Perchloroethylene and other hazardous chlorinated solvents used primarily for vapor degreasing in the metal finishing industry." "EnSolv Solvents have been proven for years to provide superior cleaning performance with no residue for medical devices such as orthopedic implants, dental tools, surgical tools and pacemakers, to name a few."
Reliance Specialty Products	GenTech	"drop in replacement for chlorinated solvents"
Poly Systems USA	Solvon	SolvonPB is useful as a cleaner - degreaser, in hot cleaning (vapor degreasing) or cold cleaning (immersion, wiping, spraying), in areas such as: Printed circuit board cleaning, precision and metal cleaning, carbon removal, automotive parts, electronics and electrical components and medical devices.

Regulations

On May 30, 2007, EPA finalized its decision to list nPB as acceptable for metals, electronics cleaning, and precision cleaning in equipment as a substitute for ozone depleting CFC-113 and methyl chloroform under the Clean Air Act. This final rule became effective on July 30, 2007[12]. This use of nPB shows the versatility of nPB as a replacement material for toxic degreasing agents in use.

Important reasons for EPA's ruling are: (1), nPB is not a hazardous air pollutant (HAP); (2), it is not listed as a hazardous waste under the Resource Conservation and Recovery Act (RCRA); and (3), it is not an ozone depleting substance. For these reasons, nPB has been accepted under the EPA's Significant New Alternatives Policy (SNAP)

[12] 30142 Federal Register / Vol. 72, No. 103 / 5/30/07

program that reviews alternatives to Class I and Class II ozone depleting substances and approves use of alternatives which do not present a substantially greater risk to public health and the environment than the substance they replace or other available substitutes[13].

The use of nPB may be controlled as a volatile organic compound (VOC) under state implementation plans (SIPs). Companies have petitioned EPA to exempt nPB from regulation as a VOC. However, unless and until EPA issues a final rulemaking exempting a compound from the definition of a VOC and States change their SIPs to exclude such a compound from regulation, that compound is still regulated as a VOC[14].

Current Use of nPB in the narrow tube industry

Superior Tube

An inspection report filed by DEP on May 1, 2007 stated that nPB has been in use since March 1, 2007 in Lubrication Spray Booth #1691. This spray booth is used for only 20% of the jobs, whereas lubrication spray booth #6779 is used for the other 80%[15].

On May 24, 2007, Superior Tube informed DEP that it wanted to replace the existing hood over its lubrication spray booth with a better capture efficiency one. The reason stated was to protect workers as the TCE substitute has a higher evaporation rate[16]. Since nPB is more volatile than TCE, it will be important to track nPB emissions from the lubrication spray booths to determine whether Superior Tube is meeting its permit limitations for VOCs.

Accellent

In a February 1, 2007 letter from Accellent to DEP, Accellent submitted an exemption request for Plan Approval and Operating Permit for the temporary use of a pilot plant to evaluate nPB as a substitute for TCE as a degreasing agent. Accellent indicated that if the pilot study results proved nPB was effective, then it would consider using it for degreasing operations[17]. It is unknown as to the status of the pilot study.

Emissions Controls

nPB is currently regulated as a VOC, therefore Superior Tube and Accellent would need to comply with DEP air quality standards for VOC emissions.

M&A recommends Superior Tube and Accellent employ nPB on the smaller TCE emitters. As a VOC, it does present some safety and environmental concerns such that its uncontrolled release in large quantities is not desirable.

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[13] 30142 Federal Register / Vol. 72, No. 103 / 5/30/07
[14] *Id*.
[15] DEP, 5/1/07. Inspection Report of Superior Tube Co.
[16] Superior Tube, 5/24/07. Letter to DEP Re: Request for Determination of Requirement for Plan Approval/Operating Permit
[17] Accellent, 2/1/07. Letter to DEP Re: Request for Determination – Temporary Pilot Study to evaluate n-propyl bromide vs. TCE as a degreasing agent.

(4) Continuous Monitoring Of TCE Emissions

Continuous monitoring devices are used in factories to provide real-time data on chemical emissions and to alert operators when there is an upset condition. Continuous monitors are installed on a gas stream to detect chemicals and then determine the concentration. In addition to the data recorder, screens, controllers, and alarms can be used to display the data and to shut down equipment if emissions exceed a thresh hold. A Fourier Transform Infrared (FTIR) spectrometer is one type of continuous monitor.

Continuous monitoring provides plant personnel with the makeup of the exhaust streams at all times. This information can be used to reduce emissions. For example, operators can determine, in real-time, when an AC bed has reached saturation, instead of relying on pre-specified periods of regeneration that may not sufficiently control emissions if any process upsets (variability in pre-control emissions) have occurred. A second example is the recent large TCE release at Superior Tube that occurred as a result of a condenser failure in VD661. After the condenser failure, significant quantities of TCE continued to be released because no one realized that the heating element was still on. Had continuous monitoring been installed to detect TCE, operators would have realized this and shut down the heating elements in a matter of minutes, not an hour and 15 minutes later.

Current Use of Continuous Monitoring in the narrow tube industry

In May, 2007, Salem submitted a Plan Approval Application to the DEP for the installation of a new vacuum degreasing line at its facility[18]. Included in the application was the installation of four FTIR spectrometers to continuously detect and measure TCE from the vacuum degreaser and AC system.

M&A recommends that Superior Tube and Accellent implement continuous monitoring of the AC systems and closed degreasing equipment. This monitoring could allow for automated alerts and controls that could result in decreased emissions, and would provide the public and regulatory agencies with information to ensure that Superior Tube and Accellent are operating its emissions controls properly.

COST OF TCE REDUCTION METHODS

Activated Carbon System

AC systems vary widely in cost depending on the size and number of AC beds, and the additional steam generation equipment/piping and separation equipment required. When Superior Tube and Accellent provide data on the additional exhaust streams, cost estimates can be determined.

Closed Degreasers

The cost of the vacuum vapor degreaser, with ancillary equipment, continuous monitoring system, installation costs, and personnel training, was quoted at $1.7 million

[18] DEP, no date. Plan Approval for the construction a Trichloroethylene (TCE) Vacuum Cleaning and Degreasing Machine at Salem Tube Inc. /Greenville Reynolds Industrial Park.

for Salem Tube. The price quote includes a top-loading vacuum vapor degreaser with a degreasing chamber that is roughly 50 ft long.

<u>nPB Substitution</u>
The cost of nPB is roughly $3.00/lb, whereas TCE (for large industrial users) costs roughly $0.70/lb, making the unit price of nPB approximately 4-5 times more expensive than that of TCE. Most users report a 5-20% reduction in solvent purchases after switching to nPB[19].

<u>Continuous Monitoring Systems</u>
The quote provided to Salem Tube for 4 FTIR spectrometers was $10,300.

TIMETABLE FOR IMPLEMENTATION

<u>Activated Carbon System</u>
It is reasonable to expect that Superior Tube and Accellent should be able to complete the aforementioned expansion/installation required to route additional equipment to AC within about one year. The completion schedules of Superior Tube's current system and Accellent's proposed system were roughly one year.

<u>Closed Degreasers</u>
It is reasonable to expect that Superior Tube and Accellent should be able to complete the evaluation and substitution of some of its degreasing equipment with closed degreasers within eighteen months.

<u>nPB Substitution</u>
It is reasonable to expect that Superior Tube and Accellent should be able to complete the evaluation and substitution of TCE with nPB within about one year. Superior Tube is currently using nPB and Accellent has proposed to employ it as substitute.

<u>Continuous Monitoring</u>
It is reasonable to expect that Superior Tube and Accellent should be able to install continuous monitoring devices concurrently with items (1), (2) and (3).

[19] Personal communication with Enviro Tech International, 10/18/07

APPENDIX A

Inventory of Equipment and TCE Emissions

Inventory of Equipment and TCE Emissions

SUPERIOR TUBE

SOURCE ID	SOURCE NAME	Equipment #	Permitted Throughput (lb/hr)[1]	2004 TCE Emissions Rolling Totals (tons)[2]	2006 TCE Emissions Rolling Totals (tons)[3]	2006 Title V Permit Limits (tons)[1]	Emissions Controls
101	Flush/Blowout Booth	1603	18.0	4.223	6.23	7.2	
102	Flush/Blowout Booth	1960	18.8	1.810	3.77	4.1	
103	Lubric. Spray Booth	6779	18.4	10.530	6.6	15.0	
104	Lubric. Spray Booth	1691	18.4	1.877	0.9	9.0	Using nPB since 3/07
113	Solvent Cleaner Tank	1291	18.4	13.369	10.97	34.0*	Proposed to be removed
115	Solvent Cleaner Tank	1369	18.4	13.721	unknown	unknown	
117	Solvent Cleaner Tank	6836	18.4	2.458	1.78	2.9	
119	Lubric. Dip Tank	6876	36.0	2.338	1.37	11.5	Removed 2/27/07
121	Lubric. Dip Tank	1205	18.4	13.947	11.29	16.3	Proposed switch to nPB 6/07
123	Storage Tank	6825	3500.0	0.150	0.2**	2.70	
124	Lubric. Spray Booth	1976	18.4	0.000	0.10	6.90	
125	Fugitive Emissions		18.0	unknown	2.16	13.80	
143	Solvent Cleaning Tank	6983	3.0	0.225	unknown	unknown	
149	Vapor Degreaser	661	80.0	7.167	9.65	20.6 / 34.0*	AC control

* #149 individual limits = 20.6; combined with #113 = 34.0. Combined emissions from #1291 and #661 were 20.62 tons;
Combined emissions limit were 34 tons
** 2005 AIMS Report; not rolling total
Source: (1) 8/8/06 Title V Permit; (2) 1/27/05 DEP Inspection Report; (3) 5/1/07 DEP Inspection Report

ACCELLENT

SOURCE ID	SOURCE NAME	Equipment #	Permitted Throughput (lb/hr)[1]	2003 TCE Emissions (tons)[2]	2006 TCE Emissions Rolling Totals (tons)[3]	2006 Title V Permit Limits (tons)[1]	Controls
103	Plant 1 Vapor Degreaser	MN 2513	8.526	21.34	28.5	37.5	AC system being installed
104S	Plant 2 Vapor Degreaser	MN 2470	9.707	unknown	38.75	none	AC system being installed
105	Fabrication Vapor Degreaser	MN 2473	0.913	unknown	<2.00	none	
109 / 111	ID & OD Plastic Coaters		1.852*	0.59**	1.75**	6.4**	

* Converted from gallons to lbs using a TCE density of 1.47 g/cm^3.
**Combined emissions from 109 and 111; 109 emits TCE, 111 emits Toluene
Source: (1) 11/8/06 Title V Permit; (2) 5/12/04 DEP Inspection Report; (3) 3/8/07 DEP Inspection Report