

**ENGINEERING EVALUATION REPORT
STRONGWELL
PLANT NUMBER 2918
APPLICATION NUMBER 2072**

BACKGROUND

Strongwell operates a polymer utility box and products manufacturing facility (Title V) in San Jose, CA. Resin and aggregate are mixed and poured into mold where it is cured. The aggregates (sand, gravel, and filler) are stored in three silos, and particulate emissions from them are abated by a baghouse, A-3.

Strongwell has requested for an increase in styrene resin solution throughput at S-5, Mixing and casting operations, and at the three aggregate storage silos, S-13, S-14, and S-15. Strongwell has also applied to obtain an authority to construct, and a permit to operate a baghouse to control particulate emissions from S-15 before they are finally routed to the existing baghouse, A-3. The purpose of the additional baghouse is to remove large particle from the exhaust of S-15 and subsequently to reduce loading on A-3.

The proposed changes are considered significant revision to the existing Title V permit as per Regulation 2-6-226, and therefore are subject to a 45-day EPA review. The Title V permit is revised to reflect these changes.

The application covers the following sources:

- S-5 Mixing and casting operations
- S-13 Aggregate silo #1 (gravel storage), 60,000 lb capacity, abated by A-3.
- S-14 Aggregate silo #2 (sand storage), 60,000 lb capacity, abated by A-3.
- S-15 Aggregate silo #3 (sand/filler storage), 60,000 lb capacity, abated by A-3 & A-4.
- A-4 Dust collector (baghouse), Pulse jet, FABRI-PULSE, Design "M" Model 2, w/filter media.

EMISSION CALCULATIONS

S-5:

At this source, the styrene resin solution after mixing with aggregate is poured into different molds for curing. Styrene is the only organic compound that is emitted from this source.

Emissions are calculated on the basis of the styrene emission factor, and resin solution throughput. There are two methods to estimate the styrene emission factor.

A. AP-42:

In the past, the emission factor for this operation was calculated as per the procedure given in U.S.EPA document AP-42 (1/95) for Polyester Resin Plastic Products Fabrication (Chapter 4.4).

Resin solution throughput = 1 gallon
Resin solution density = 9 lb/gallon
Styrene content = 43% by weight of resin solution (Table 4.4-3)

The Styrene emission factor is 0.045 lb/lb of monomer, which is an average emission factor of 0.02 and 0.07 for vapor-suppressed resin process (Table 4.4-2).

Styrene emission factor, EF
= (1 gallon of resin solution)(9.0 lb/gallon)(0.43 lb of styrene/lb of resin solution)(0.045 lb/lb styrene monomer)
= 0.174 lb/gallon of resin solution

B. Source Test:

Strongwell conducted a source test at their facility during December, 2000 to generate a styrene emission factor from this operation. Testing was carried out in accordance with EPA Method 204. The test report was reviewed by Bob Bartley of the Source Test Section of the District and was found to be acceptable. The highest average styrene emissions are 1.13% of monomer present in the resin solution, which is used to estimate the styrene emission factor.

Styrene emission factor, EF
= (1 gallon of resin solution)(9.0 lb/gallon)(0.43 lb of styrene/lb of resin solution)(0.0113 lb/lb styrene monomer)
= 0.04373 lb/gallon of resin solution

Resin solution throughput: 330,000 gallons/yr (current);
500,000 gallons/yr (proposed)

Total POC emission at proposed throughput = (500,000 gallons/yr)(0.04373 lb/gallon) = 21,865 lb/yr
= 10.933 tpy

POC emissions increase = (500,000 - 330,000 gallons/yr)(0.04373 lb/gallon)
= 7434 lb/yr
= 3.717 tpy
= 20.37 lb/day @365 days/yr

S-13 through S-15:

Only particulate emissions are expected from these sources. Emissions were estimated on the basis of an exhaust flow rate of 5000 cfm, an exhaust grain loading of 0.01 gr/dscf from the baghouse, A-3, and an operating schedule of 8 hrs/day; 365 days/yr (very conservative schedule as compare to the schedule given on data forms G) when these sources were originally permitted.

PM10 = (0.01 gr/dscf)(5,000 cfm)(480 min/day)/(7000 gr/lb)
= 3.43 lb/day
= 1252 lb/yr @365 days/yr
= 0.626 tpy

PM10 emissions thus calculated are the maximum expected from these sources, and therefore the increase in the material throughput from 195 ton/yr to 575 ton/yr will not affect PM10 emissions. In fact, emissions might decrease because of installation of additional baghouse, A-4, for S-15 before its exhaust is finally routed to the baghouse, A-3.

PLANT CUMULATIVE INCREASE

POC = 3.717 tpy
PM10 = 0.0 tpy

BACT DETERMINATION

The styrene resin solution throughput increase at S-5 will result in increase in POC emissions greater than 10 lb/day, and therefore is subject to the BACT requirement of Regulation 2-2-301.

For this source, BACT1 as per BACT/TBACT Workbook is enclosure of operation and vent to an afterburner (≥ 0.3 second retention time at ≥ 1400 degree Fahrenheit) or an activated carbon adsorption system (VOC concentration < 6 ppm at outlet). BACT2 is compliance with Regulation 8-50, and use of aqueous emulsion cleaner instead of acetone for clean up.

The applicant has submitted a cost-effectiveness analysis for BACT1.

1. Afterburner system:

Total annual cost = \$1,221,504
VOC reduction = (10.933 tpy)(0.9)
= 9.84 tpy (assuming 90% collection and control)
Cost of abatement = \$1,221,504/9.84 tpy = \$124,137/ton

2. Carbon adsorption system:

Total annual cost = \$489,224
VOC reduction = 9.84 tpy (assuming 90% collection and control)
Cost of abatement = \$489,224/9.84 tpy = \$49,718/ton

The cost of abatement is greater than the cost effectiveness cost of \$17,500/ton, therefore **BACT1 is not cost effective.**

The source, S-5, complies with the requirements of BACT2.

The silos are not subject to the BACT requirements of Regulation 2-2-301.

TOXIC EMISSIONS AND HEALTH RISK SCREENING ANALYSIS

Styrene is a toxic compound listed in the Table 2-1-316 of Regulation 2 Rule 1. Emissions of styrene are less the toxic trigger level of 140,000 lb/yr, therefore a health risk screening analysis is not required.

OFFSET REQUIREMENTS

Facility wide POC emissions are less than 15 tpy, and therefore are not subject to the offset requirements of Regulation 2-2-302.

STATEMENT OF COMPLIANCE

On the basis of the information submitted, the facility complies with the applicable requirements of the regulations.

The project is exempt from CEQA review because it is ministerial in nature (Permit Handbook Chapter 11.12).

A health risk screening analysis is not required as discussed in the toxic emissions and health risk screening analysis section of this report.

PSD and NSPS do not apply.

Section 112(g) of the Federal Clean Air Act is implemented in the Bay Area by BAAQMD Regulation 2, Rule 2, Sections 114 and 317. This project is exempt from the Maximum Achievable Control Technology (MACT) requirement pursuant to Section 2-2-114.1 because the proposed increase is less than 10 tons per year of styrene.

PERMIT CONDITIONS

The permit conditions ID #16674 for the silos and ID #17170 for the mixing and casting operations are revised.

RECOMMENDATIONS

It is recommended that Strongwell shall be issued:

- a. a Permit to Operate the abatement device, A-4,
- b. revised permit conditions for the sources described in the background section of this report, and
- c. revised Title V permit for the facility.

EXEMPTIONS: None

BY: _____
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