HZW
Environmental
Consultants

June 7, 2024

Ms. Laura Miracle
Akron Regional Air Quality Management District
1867 West Market Street
Akron, Ohio 44313

Subject: ***Updated Reasonable Available Control Technologies (RACT) Review, APV Engineered Coatings, 1390 Firestone Parkway, Akron, Ohio***

Dear Ms. Miracle:

In accordance with Ohio Administrative Code (OAC) Chapter 3745-21-11 and in response to the comments received from the Ohio Environmental Protection Agency (EPA) and Akron Regional Air Quality Management District (ARAQMD), HZW Environmental Consultants, LLC (HZW), on behalf of APV Engineered Coatings (herein referred to as "APV"), respectfully submits the following review of Reasonable Available Control Technologies (RACT) at APV in Summit County.

APV is a manufacturer of custom-formulated paints and coatings. Volatile Organic Compounds (VOC) emissions are generated from the following processes at APV:

- Mixing Operations
- Can Cleaning
- Silkscreen Operations
- Aboveground Storage Tank Solvent Storage
- Rubber Churns
- Mills

It should be noted that the most recent air emissions inventory was completed in 2022 in response to the Akron Regional Air Quality Management District (ARAQMD) Inspection conducted in 2021. The potential-to-emit calculations were completed using the emission calculation outlined in *EIIP Volume II: Chapter 8 (Methods for Estimating Air Emissions from Paint, Ink and Other Coating Manufacturing Facilities*). Based on the potential-to-emit calculations, the emission units that require Permits to Install-and-Operate and generate the majority of the VOC emissions at the facility, are the mixing operations and associated clean. Therefore, these processes will be the focus of the RACT review.

RACT Review

In accordance with OAC 3745-21-11, the following items have been reviewed in order to determine the technical and economic feasibility of reducing the VOC emissions from the sources at the facility which are not otherwise regulated under the Ohio EPA's Control Technique Guidelines (CTG) regulations outlined in OAC 3745-21 and to define RACT for the source.

Below you will find the outline and citations of OAC 3745-21-11 with associated responses.

OAC 3745-21-11(B)(1)
The complete facility name, Ohio EPA air program facility identification number, and address.

APV Engineered Coatings
Facility ID 1677010028
1390 Firestone Parkway
Akron, Ohio 44301

OAC 3745-21-11(B)(2)
The name, title, address and telephone number of the owner or operator's representative within the company who is the contact person for this facility regarding the engineering study and affected sources.

Michael Summers
Vice President/General Manager
1390 Firestone Parkway
Akron, Ohio 44301
330-773-8911

OAC 3745-21-11(B)(3)
The name, title, address and telephone number of the official who is responsible for approval of the engineering study.

Michael Summers
Vice President/General Manager
1390 Firestone Parkway
Akron, Ohio 44301
330-773-8911

OAC 3745-21-11(B)(4)
The standard industrial classification code and source classification code numbers which are applicable to the facility's operations.

SIC Code 2851 (Paints, Varnishes, Lacquers, Enamels, and Allied Products)
SCC Code 30101401 (Paint Manufacture General Mixing and Handling)

OAC 3745-21-11(B)(5)

(a) Current Ohio EPA application number(s).

Please refer to **Attachment 1.**

(b) Company identification and Ohio EPA emissions unit identification number(s).

Please refer to **Attachment 1.**

(c) Source description.

Please refer to **Attachment 1.**

(d) Month and year installed.

Please refer to **Attachment 1.**

(e) Normal operating schedule (hours per day, days per week and weeks per year).

8 hours/day; 5 days/week; 51 weeks/year

(f) Annual production rates for each of the three full calendar years preceding the effective date of this rule.

Year	**Amount of Paint Manufactured (gallons)- Provided by APV, based on paint production**
2023	814,146
2022	1,077,404
2021	1,155,827

(g) Average and maximum daily production rates for each of the three full calendar years preceding the effective date of this rule.

Year	**Total Production Rate During Calendar Year (Gal)**	**Number of Production Days in Year**	**Average Daily Production Rate (gals/day)**-Total Annual Production Rate/Number of Production Days in a Year
2023	814,146	254	3,205
2022	1,077,404	258	4,176
2021	1,155,827	251	4,605

Year	Maximum Production Rate (Gals/day)	Date of Maximum Production
2023	13,731	February 28, 2023
2022	22,206	January 7, 2022
2021	22,570	January 4, 2021

(h) The type of control equipment employed, and the date installed.

The facility uses mixer covers as control equipment for VOC emissions. Mixers are covered at all times with the exception of loading materials as needed. Mixer cover control efficiency was calculated using USEPA's EIIP surface evaporation calculations for the following mixer diameters, assuming no cover: 2-foot, 4-foot, 6-foot, 8-foot and 1-inch (diameter with mixer cover applied). Since it is a commonly-used solvent at APV, petroleum-distillates was used for the chemical-specific information (vapor molecular weight, gas-phase mass transfer coefficient, and vapor pressure). Based on the calculation for surface evaporation, the range of control efficiency is greater than 99% for each tank diameter size. The following table summarizes the emissions and control efficiency.

Mix Tank Diameter	VOC Emissions - Uncovered (lbs/year)	VOC Emissions with cover (lbs./year); based on 1-inch diameter	Control Efficiency %
2	214.84	0.37	99.83%
4	859.38	0.37	99.96%
6	1933.60	0.37	99.98%
8	3437.51	0.37	99.99%

(6) A plot plan which shows the general layout of the facility and the affected sources.

Please refer to **Attachment 2.**

APV has multiple production buildings located on one (1) property. Based on production demand, portable mixers may move from building to building.

(7) The following emissions data for each affected source.

APV does not maintain emissions data for each emission unit as this is not a requirement of the Ohio EPA-issued FEPTIO. APV does maintain facility-wide emission data, which is included in the following sections. APV has not been required to conduct emissions testing on any individual emissions unit or groups of emissions units and, therefore, has no testing data. However, APV does feel that the potential emissions calculations completed as part of its most recent permitting event (using methods outlined in EIIP Volume II Chapter 8 Preferred and Alternative Methods for Estimating Air Emissions from Paint and Ink Manufacturing Facilities Revised Final August 2000) represent potential emissions from each emissions unit. Further, the mass balance calculations completed as

part of FEPTIO recordkeeping requirements accurately reflect the actual emissions from the emissions units. Of the emissions discussed in item 7(a), below, APV can break out emissions from the following "groups":

- Mixing
- Can Cleaning
- Silk Screening
- Mill Wash Usage (Facility-wide Cleaning Usage)

(a) Average daily VOC emissions (pounds per day of operation) based upon the highest average daily production rate for each of the three full calendar years preceding the effective date of this rule or any other year that may be representative of the highest average daily emissions.

Group	**Year**	**VOC Emissions (lbs.)**-from 12-month rolling workbook	**Number of Production Days in Year-*from monthly air recordkeeping***	**Average Daily VOC Emissions (lbs./day)**-Total Annual VOC Emissions/Number of Production Days in a Year
Mixing	2023	47310	254	186.26
	2022	53210	258	206.24
	2021	55765	251	222.17
Can Cleaning	2023	370	254	1.46
	2022	440	258	1.70
	2021	455	251	1.81
Silkscreen	2023	550	254	2.17
	2022	515	258	2.00
	2021	615	251	2.45
Mill Wash Usage	2023	4330	254	17.05
	2022	6250	258	24.22
	2021	6700	251	26.69

The VOC emissions (TPY) outlined above are taken from the 12-Month Rolling VOC Calculations that are completed in accordance with air permit recordkeeping requirements. Please find the 12-Month Rolling Workbook included as **Attachment 3.**

Please note that the VOC emissions are based on mixing, mill wash usage, can cleaning, silkscreen, and storage tanks. Per the terms and conditions of the current Federally Enforceable Permit to Install/Operate (FEPTIO), the emissions from the storage tanks are no longer required to be included in the rolling 12-month emission calculations.

[Comment: The average daily production rate for a calendar year may be calculated in the following manner:

Average daily production rate = [(total production rate during the calendar year) / (number of days production occurred during the calendar year)]

Repeat the calculation for each of the three calendar years preceding the effective date of this rule. The highest value of these three years is the representative value used to calculate the average daily VOC emissions per year.]

(b) Maximum daily VOC emissions (pounds per day of operation) based upon the highest maximum daily production rate for each of the three full calendar years preceding the effective date of this rule or any year that may be more representative of the highest maximum daily emissions.

Year	**Maximum Daily Emissions-lbs./day-**based on Monthly VOC recordkeeping	**Date of Maximum Emissions**
2023	826.09	January 19, 2023
2022	930.50	January 28, 2022
2021	1002.42	June 23, 2021

(c) Annual VOC emissions (tons per year) based upon the highest annual production rate for each of the three full calendar years preceding the effective date of this rule or any year period that may be more representative of the annual production rate.

Year	**VOC Emissions (TPY)-from 12-month rolling recordkeeping**
2023	26.6
2022	31.8
2021	33.2

Per the terms and conditions of the FEPTIO, APV records the amount of each raw material used each day as well as the percent of VOC by weight in each material. The tons per year of VOC from mixing is calculated with the following formula:

(Amount Used (lbs.) x % VOC by weight x emission factor (1.5%))/2000 lbs./ton

APV also maintains records for amount of mill wash used in mixing on a monthly basis, and the amount of mill wash used in can cleaning and silkscreen emissions, which are also included in the total VOC Emissions (TPY).

(d) General composition of the VOC emissions.

The VOCs emitted at APV include non-halogenated and halogenated solvents. Halogenated solvents used at APV include chloroform and chlorobenzene. It should be noted that these solvents are used

in very small quantities compared to the non-halogenated solvents. Chloroform has not been used since 2022. The following non-halogenated hazardous air pollutant (HAP) solvents have been used in the largest amount year-to-year at APV include toluene, xylene, ethylbenzene, methanol and methyl isobutyl ketone.

(e) If coating materials are used in the source, the company identification and formulation of each coating [VOC content (pounds per gallon of coating and pounds per gallon of coating, excluding water), water content (per cent by volume), solids content (per cent by volume), and exempt organics content (per cent by volume)].

As previously mentioned, APV is a manufacturer of custom-formulated paints and therefore, the number of formulas is extensive. Please refer to the list of coatings used in the Potential-to-Emit calculations included as **Attachment 4**. Please note that APV is producing more water-based products than in previous years due to customer and industry demand.

(f) Composition, density and quantity (pounds per day of operation and tons per year) of any clean-up solvents which were employed during the calendar year.

APV utilizes Mill Wash to clean the mix tanks and mixing cans. HiSol solvent is used for cleaning at the Silkscreen operations. Clean up materials are tracked in accordance with APV's FEPTIO. The Safety Data Sheets (SDSs) for these cleaning solvents are included as **Attachment 5**.

Clean-Up Solvent Name	Year	Usage (TPY)-based on monthly recordkeeping provided by APV	Days of Operations	Usage (lbs/day) ((Usage (TPY)*2000)/days of operation)
Mill Wash	2023	2.23	254	17.56
	2022	3.17	258	24.57
	2021	3.35	251	26.69
Hi-Sol	2023	0.001	254	0.001
	2022	0.01	258	0.08
	2021	0.08	251	0.64

It should be noted that the manner in which clean up materials are calculated was updated between 2021 and 2022 based on recommendations from the ARAQMD from an air compliance inspection conducted in 2021.

(g) Documentation of the efficiency of the existing control equipment.

Other than mixer covers, there is no additional existing engineering control efficiency for VOCs at APV. Other control methods are used at APV and will be discussed below in detail.

(h) Documentation of any emissions testing which has been performed.

VOC Emission testing has not been conducted at the facility as the VOC emissions are considered to be fugitive emissions at APV.

(8) A detailed discussion of the technical feasibility of employing each of the following types of control measures for each affected source (or combination of sources):
(a) Carbon adsorber (with and without recovery of the organic compounds).

Based on the operations at APV, this control would not be appropriate. Based on the "*EPA Air Pollution Control Cost Manual*[*], *EPA/452/B-02-001*", when properly designed, operated and maintained, carbon adsorbers can achieve high VOC removal efficiencies of 95 to 99 percent at input VOC concentrations of between 500 and 2,000 ppm in air, which is less than the control efficiency of the calculated control efficiency of mixer covers.

(b) Thermal incinerator (with and without heat recovery).

Based on the USEPA RACT Search, included as **Attachment 6**, a thermal incinerator would be the most appropriate control technology for control of VOC emissions in a paint manufacturing industry.

Based on the capital cost and ongoing operating costs as well as a control efficiency of 98%, although the best engineering control option, a thermal oxidizer would not provide greater control efficiency or cost efficiency than the that of mixer covers.

(c) Catalytic incinerator (with and without heat recovery).

Based on the operations at APV, this control would not be appropriate. According to the *Air Pollution Control Cost Manual*[*], *Section 3.2, Chapter 2 - Incinerator*, the sensitivity of catalytic incinerators to VOC inlet stream flow conditions and catalyst deactivation limit the applicability to many industrial operations. Thermal incineration would be favored over catalytic incineration due to the following factors of catalytic incineration:

- the fouling of the catalyst;
- possibility of upsets that could release poisons (i.e., heavy metals, phosphorus, sulfur and halogens);
- fluctuations in the heating value to the incinerator;
- limits to the types of compounds that can be oxidized due to the poisoning effect some species have on the catalyst; and,
- cost of replacing catalyst over time.

(d) Condenser.

Based on the operations at APV, this control would not be appropriate. Based on *the EPA Technical Bulletin - Refrigerated Condensers for Control of Organic Emissions*, condensers use NOx in the process and therefore, require additional NOx reduction techniques to be implemented in addition to the control technology. Condensers are also best used for only one (1) organic compound or one that is the most difficult to control, however, this would not be ideal at APV due to the variety of VOCs used, dependent on products made.

The destruction and removal rate is also limited by the amount of organic vapor that escapes with the exhaust from the condenser, which is determined by both the vapor pressure of the condensed liquid and the amount of air present in the emission stream. Any single organic compound cannot be recovered with high purity from a mixture of organic vapors by condensing it, because all of the organic compounds are condensed and collected together. Therefore, the destruction and removal rate at APV would be limited due to the organic vapor controlled being mixtures of VOCs.

(e) Scrubber.

Based on the operations at APV, this control would not be appropriate. According to *EPA Fact Sheet - Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015* , the typical collection efficiency range is from 70 to greater than 99 percent. Additional scrubber disadvantages include:

- potential creation of water (or liquid) disposal problem;
- waste product collected wet;
- PM may cause plugging of the bed or plates; and,
- relatively high maintenance costs.

(f) Any other such RACT alternatives not listed in paragraph (B)(8) of this rule that may be applicable to an affected source, or as are proposed by the owner or operator.

Not applicable

A detailed engineering discussion is not required for those control measures which are not applicable to a particular source.

(9) For each type of control measure that is determined to be technically feasible, an estimate of the control efficiency that can be achieved.

APV has obtained specifications for thermal oxidizer units. Based on the quote provided to APV, the proposed thermal oxidizers would have a destruction rate for VOCs of 98%.

Currently, as an industry-accepted control based on United State (US) EPA's "*Control Techniques for Volatile Organic Compound Emissions from Stationary Sources*", APV uses mixer covers to control VOC emissions. The mixer covers prevent loss of product and solvent due to evaporation and reduce the surface area for fugitive VOC emissions from the mixer. As previously mentioned, based on the

USEPA's EIIP calculation for surface evaporation, the range of control efficiency is greater than 99% for mixer covers.

(10) If coating materials are used in an affected source, a detailed discussion of the technical feasibility of converting to waterborne, high-solids or powder coatings to minimize or eliminate the VOC emissions (statements from several major coating suppliers should be obtained to document the conclusions).

APV produces coatings but does not use them (with the exception of silk screening). However, APV has increased the amount of water-based coatings produced over time. APV has several mixers that are designated specifically for water-based coatings as industry standards shift to materials with lower VOC content. APV's typical water-based coating yield is 35% of total production.

(11) A detailed discussion of the technical feasibility of modifying or replacing the source in order to minimize or eliminate the VOC emissions.

The sources of VOC emissions at APV include paint mixing operations as well as cleaning operations. The products mixed at APV are based on customer demand. The processes by which the mixing is conducted cannot be replaced. However, modifications to the sources that APV has implemented include industry- accepted controls during mixing such as covering mixers during mixing operations and piping solvents directly into mix tanks from bulk storage areas to reduce VOC emissions from loading raw materials.

(12) A quantification of the VOC emission reductions that could be achieved, at the production rates for the calendar year, by each control option that is determined to be technically feasible.

Year	VOC Emissions (TPY)	VOC Destruction	Total VOC Emissions Reductions-TPY (VOC emissions * VOC Destruction)	Total VOC Emissions After Reduction-TPY (VOC Emissions-Total VOC Reduction)
2023	26.6	98%	26.1	0.5
2022	31.8	98%	31.2	0.6
2021	33.2	98%	32.5	0.7

(13) For each control option that is determined to be technically feasible, an estimate of the capital cost, annualized cost (including capital and operating costs), and the cost-effectiveness (annual dollars per ton of VOC removed annually).

Due to the facility layout and mixing operation locations, APV would need to install three (3) thermal oxidizers at the facility. Mixing operations at APV are located throughout several production buildings; therefore, there is not one specific location to be controlled by a thermal oxidizer. A quote has been obtained for thermal oxidizers; however, the quote is confidential due to pricing, engineering and proposal format and therefore is not included in this RACT version.

In addition to the control equipment, using the US EPA's *Cost Reports and Guidance for Air Pollution regulations Chapter 3-VOC Controls; Section 3.2-VOC Destruction Controls*, the estimated annual operating costs and indirect costs have also been calculated and included in the table below. The data input and the output from US EPA's *Cost Reports and Guidance for Air Pollution regulations Chapter 3-VOC Controls; Section 3.2-VOC Destruction Controls* is included in **Attachment 7**.

Expense	Source	Amount
Estimated Annual Operating Cost PER OXIDIZER	Cost Reports and Guidance for Air Pollution regulations: Chapter 3-VOC Controls; Section 3.2-VOC Destruction Controls	$39,199.00
Estimated Annual Indirect Cost PER OXIDIZER	Cost Reports and Guidance for Air Pollution regulations: Chapter 3-VOC Controls; Section 3.2-VOC Destruction Controls	$189,652.00

Estimated cost effectiveness of the thermal oxidizers would be $123,385.00 per ton of VOC removed.

(14) A comparison and discussion of the advantages and disadvantages of control options that are determined to be technically feasible.

The advantage of installing the thermal oxidizers is the benefit of VOC destruction of 98%. However, the cost of the installation of the thermal oxidizers as well as the estimated annual cost is not economically feasible for APV. As previously mentioned, APV has multiple production buildings with several portable mixers being able to move to a new location as needed based on production demand. It is not feasible to install a stationary control unit for these emission units. Although movement of emission units does not occur often, the ability to move equipment is essential for APV as they are a custom-batch paint manufacturer with various production amounts and formulas.

APV has implemented the use of mixer covers as the control for VOC emissions. This allows the facility to control VOCs in addition to providing flexibility of production location. The mix tank covers are also cost efficient and reduce the amount of VOC and solvent from evaporating from the product and therefore allows for minimal reduction of product yield.

(15) A recommended definition of RACT for the source, including one or more of the following:
(a) Enforceable production limitations.

Due to the number of mixers at the facility, it is not feasible to enforce production limits on each mixer. In lieu of production limitations, VOC emissions at APV have historically been restricted with emission limitations in APV's FEPTIO. Based on the actual facility-wide emissions at APV, emissions have been well below 99.9 tons per year of VOC.

(b) Emissions limitations.

As previously mentioned, APV has limited the facility-wide VOC emissions to below 99.9 tons per year.

(c) Control efficiencies.

Other than mixer covers, there are no additional engineering controls for VOC emissions at APV.

(d) Operating requirements.

In order to reduce VOC emissions at APV, the facility has implemented the following industry-approved best practices, which are also discussed in US EPA's *"Control Techniques for Volatile Organic Compound Emissions from Stationary Sources"*:

- During paint manufacturing, solvents may evaporate during mixing or holding of coatings and therefore, the covering of mixers is an integral step in the mixing process. Any mixing/blending tank containing paint material shall be equipped with a cover that completely covers the tank opening except for an opening no larger than necessary to allow for safe clearance for the mixing shaft. For tanks that do not have an associated manufactured cover, an elastic cover is used to form a tight seal around the shaft and tank.

- The emissions unit shall be kept covered at all times, except when additions, production sampling, inspection, and cleaning procedures require access.

- The cleaning of a tank with organic solvents shall be done with the tank completely covered/enclosed to the fullest extent possible.

- The facility has in place preventative maintenance for process and control equipment along with routine inspections of pumps, valves and fittings.

- Good housekeeping practices implemented at the facility include keeping containers closed and ensuring there are no leaks/spills from equipment. Spills are cleaned immediately by using spill kits, which are located throughout the facility. Used spill material is stored in a closed drum.

- APV reduces the amount of manual solvent transfer hard piping the solvent storage tanks to the mixers where manifolds are used to transfer solvents from aboveground storage tanks to mix tanks.

Conclusion:

Based on the determination of RACT by reviewing engineering controls in addition to operational limitations, it has been determined that implementing emission limitations and operational restrictions that are currently in use are the most cost effective and feasible application of RACT for the APV. Thermal oxidizers are not only not economically feasible for APV to install and operate, but these types of controls will reduce the ability to move equipment as needed based on production demands in the future. Applicable controls to APV have already been implemented and are effective immediately.

Sincerely,

HZW Environmental Consultants, LLC

Brooke Thompson, CHMM
Group Leader, Environmental Compliance

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Attachment 1

Affected Source General Information

ATTACHMENT 1

AFFECTED SOURCE INFORMATION

Associated Application Number	Emissions Unit ID	APV ID	Source Identification	Month/Year Installed
OAC 3745-21-11(B)(5)(a)	*OAC 3745-21-11(B)(5)(b)*		*OAC 3745-21-11(B)(5)(c)*	*OAC 3745-21-11(B)(5)(d)*
A0071797	P001	A4	1/2 HP Air Mixer	12/1973
A0071797	P002	C17	50 HP Myers Mixer with tank	4/2001
A0071797	P003	A3	1/2 HP Air Mixer	12/1973
A0071797	P004	A6	1/2 HP Air Mixer	12/1973
A0071797	P005	A5	1/2 HP Air Mixer	12/1973
A0071797	P009	R4	3/4 HP Rail Mixer	12/1973
A0071797	P012	R5	1/2 HP Rail Mixer	12/1973
A0071797	P013	R2	3/4 HP Rail Mixer	12/1973
A0071797	P015	R12	3/4 HP Rail Mixer	12/1973
A0071797	P017	C11	25 HP Cowles Mixer	12/1973
A0071797	P018	R15	3/4 HP Rail Mixer	12/1973
A0071797	P019	C2 w/ T23 or T24	50 HP Cowles Mixer	12/1973
A0071797	P021	C3	60 HP Cowles Mixer (Schold)	12/1973
A0071797	P022	C10	50 HP Hockmeyer Mixer	4/2001
A0071797	P024	A1	1/2 HP Air Mixer	12/1973
A0071797	P025	A2	1/2 HP Air Mixer	12/1973
A0071797	P026	C14	Cowles Mixer	12/1973
A0071797	P028	C5	Cowles Mixer	12/1973
A0071797	P029	C6	Cowles Mixer	12/1973
A0071797	P030	C7	Cowles Mixer	12/1973
A0071797	P031	C8	Cowles Mixer	12/1973
A0071797	P032	C9	Cowles Mixer	12/1973
A0071797	P033	R13	3/4 HP Rail Mixer	12/1973
A0071797	P034	R14	3/4 HP Rail Mixer	12/1973
A0071797	P038	R3	3/4 HP Rail Mixer	12/1973
A0071797	P041	R6	3/4 HP Rail Mixer	12/1973
A0071797	P042	R7	3/4 HP Rail Mixer	12/1973
A0071797	P045	P1	Post Mixer	12/1973
A0071797	P046	P2	Post Mixer	12/1973
A0071797	P052	C1	25 HP Cowles Mixer	12/1973
A0071797	P053	C16	25 HP Cowles Mixer	12/1973
A0071797	P056	C15	15 HP Cowles Mixer	12/1973
A0071797	P060	T46	Mix Tank	12/1973
A0071797	P061	T45	Mix Tank	12/1973
A0071797	P062	Tank 21	Mix Tank (w/mobile tank)	12/1973
A0071797	P063	Tank 22	Mix Tank (mobile)	12/1973
A0071797	P068	R1	3/4 HP Rail Mixer	12/1973
A0071797	P078	Tank 16	Mix Tank	12/1973
A0071797	P079	Tank 17	Mix Tank	12/1973
A0071797	P081	Tank 5	Mix Tank	12/1973
A0071797	P082	Tank 11	Mix Tank	12/1973
A0071797	P086	Tank 10	Mix Tank (2-speed dispenser mixer)	12/1973
A0071797	P089	Tank 1	Mix Tank	12/1973
A0071797	P090	Tank 2	Mix Tank	12/1973
A0071797	P091	Tank 3	Mix Tank	12/1973
A0071797	P092	Tank 4	Mix Tank	12/1973
A0071797	P095	Tank 8	Walkway Mixer	12/1973
A0071797	P124	H18	Reynolds Mixer (100 HP) w/tank	1/2001
A0071797	P125	H19	Reynolds Mixer (100 HP) w/tank	1/2001
A0071797	P126	H17	Reynolds Mixer with tank	1/2001
A0071797	P127	H20	Reynolds Mixer with tank	1/2001
A0071797	P128	DS21	Dualshaft Myers Mixer with Tank	4/2001
A0071797	P129	Tank #9	Dualshaft Myers Mixer with Tank	4/2001
A0071797	P130	Tank #12	Dualshaft Myers Mixer with Tank	4/2001
A0071797	P136	DS22	100 HP Dual Shaft SS Mixer with tank	1/2005

ATTACHMENT 1

AFFECTED SOURCE INFORMATION

A0071797	P137	PM1	50 HP Schold Mixer with jacketed tank	12/2005
A0071797	P139	DS25	Dual Shaft Mixer	9/2006
A0071797	P140	DS26	Dual Shaft Mixer	9/2006
A0071797	P141	DS27	Dualshaft Hockmeyers Mixer with Tan	9/2006
A0071797	P170	C47 (was T62)	Tank with 100 HP Cowles Mixer	8/2008
A0071797	P142	C21	15 HP Cowles Mixer	2/2011
A0071797	P143	DS28	Dual Shaft Mixer with mix tank	2/2011
A0071797	P144	C18	15 HP Cowles Mixer	2/2011
A0071797	P145	A40	1/2 HP Air Mixer	2/2011
A0071797	P148	C22	25 HP Hockmeyer Mixer	7/2014
A0071797	P149	H15	25 HP Reynolds Mixer with tank	7/2014
A0071797	P150	H16	100 HP Reynolds Mixer	7/2014
A0071797	P151	C23	50 HP Mixer with tank	2/2013
A0071797	P154	C25	50 HP Mixer with tank	7/2015
A0071797	P157	A8	1/2 HP Air Mixer	7/2011
A0071797	P157	A9	1/2 HP Air Mixer	7/2011
A0071797	P157	A7	1/2 HP Air Mixer	7/2011
A0071797	P157	A10	1/2 HP Air Mixer	7/2011
A0071797	P158	C24	50 HP Mixer with tank	6/2015
A0071797	P159	C26	25 HP Cowles Mixer	10/2015
A0071797	P160	C27	15 HP Cowles Mixer	10/2015
A0071797	P161	R29	Reynolds Mixer with tank	10/2015
A0071797	P162	R30	Reynolds Mixer with tank	10/2015
A0071797	P164	C28	50 HP Cowles Mixer	3/2018
A0071797	P165	C29	50 HP Cowles Mixer	3/2018
A0071797	P166	C30	50 HP Cowles Mixer	3/2018
A0071797	P171	A11	1/2 HP Air Mixer	1/2021
A0071797	P172	A12	1/2 HP Air Mixer	1/2021
A0071797	P174	C32	25 HP Cowles Mixer	6/2018
A0071797	P175	C12	25 HP Cowles Mixer	1/2015
A0071797	P176	C16	25 HP Cowles Mixer	1/2018
A0071797	P177	C39	25 HP Cowles Mixer	9/2021
A0071797	P178	C4	30 HP Cowles Mixer (with T25 & T26)	1/1994
A0071797	P179	C19	Cowles Mixer	1/2006
A0071797	P180	C20	Cowles Mixer	1/2006
A0071797	P181	C31	Cowles Mixer with tank	1/2020
A0071797	P182	C33	Water-Based High Speed Mixer	9/2021
A0071797	P183	C34	Water-Based High Speed Mixer	9/2021
A0071797	P184	C35	Water-Based High Speed Mixer	9/2021
A0071797	P185	C36	Water-Based High Speed Mixer	9/2021
A0071797	P186	C37	Water-Based High Speed Mixer	9/2021
A0071797	P187	C38	Water-Based High Speed Mixer	9/2021
A0071797	P188	C40	30 HP Cowles Mixer	9/2021
A0071797	P189	C41	30 HP Cowles Mixer	9/2021
A0071797	P190	C42	30 HP Cowles Mixer	9/2021
A0071797	P191		SS Mix Tank with 10 HP Agitator	1/2021
A0071797	P192	T41	SS Tank with 2 HP Air Motor	5/2015
A0071797	P193	GCTB	SS Conical Tank w/agitator	11/2020
A0071797	P194	GPTC	SS Conical Tank w/agitator	11/2020
A0071797	P195	GOP1	SS Tank with Air Mixer	11/2020
A0071797	P196	GOP2	SS Tank with Air Mixer	11/2020
A0071797	P197	GWP1	SS Tank with Air Mixer	11/2020
A0071797	P198	GWP2	SS Tank with Air Mixer	11/2020
A0071797	P199		Nauta Mixer Tank	12/2021
A0071797	P200	T15	SS Tank with Air Mixer	1/2000
A0071797	P201	C43	High-Speed Mixer	12/2021
A0071797	P202	C45	High-Speed Mixer	12/2021

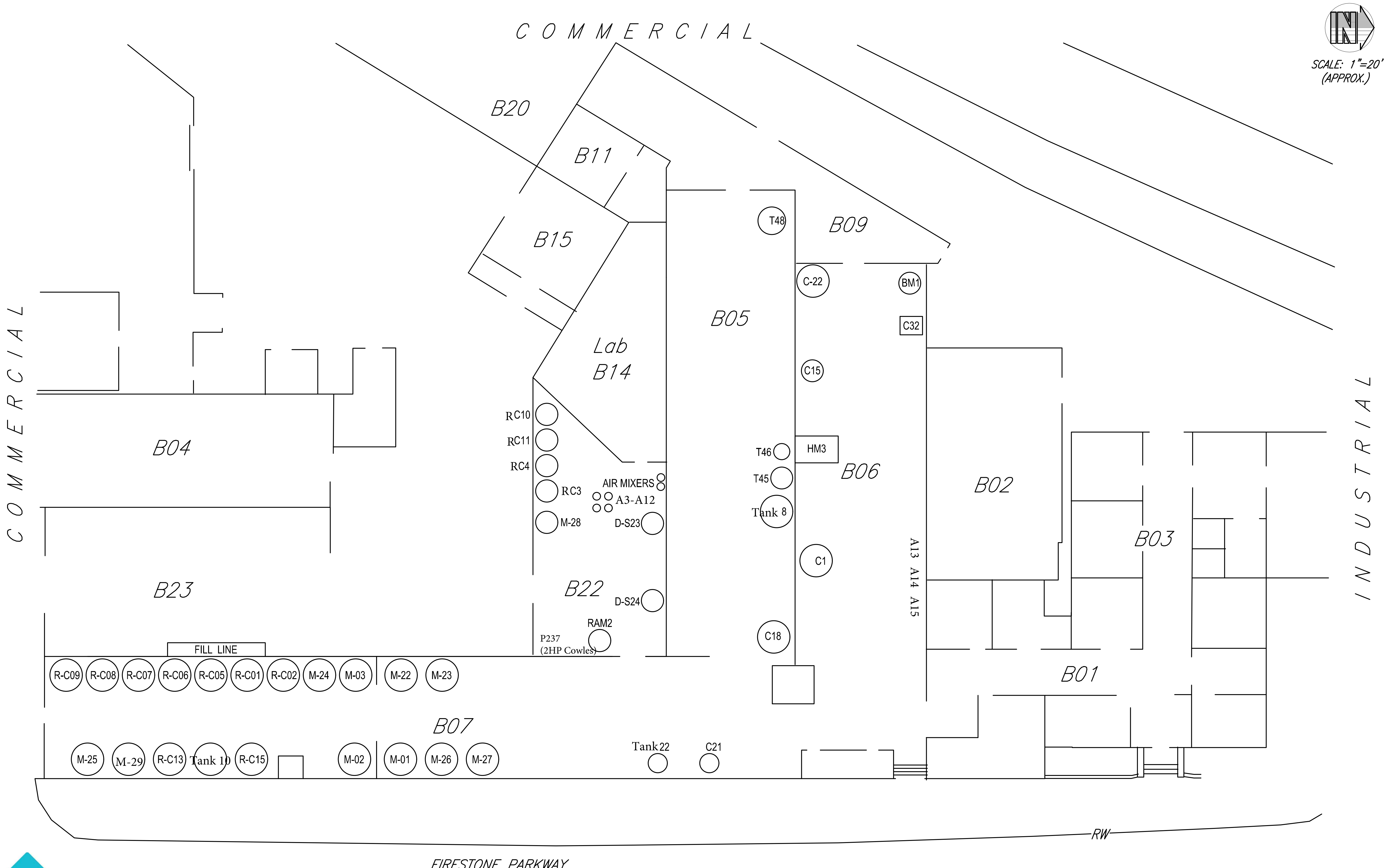
ATTACHMENT 1

AFFECTED SOURCE INFORMATION

A0071797	P203	C44	High-Speed Mixer	12/2021
A0071797	P204	C46	High-Speed Mixer	12/2021
A0071797	P205	DS24 & RAM 2	5 HP Ross Dual Shaft Mixer with pot	1/2002
A0071797	P206	A11	Plastic Mixing Tank	4/2005
A0071797	P209	DS23	1/2 HP Dual Shaft Mixer	1/2005
A0071797	P210	T16	SS Tank with Air Mixer	1/2000
A0071797	P207	T64	Tank with Electric Mixer	1/2000
A0071797	P208	T65	Tank with Eletric Mixer	1/2000
A0075507	P230	T60	Mix Tank	1/2000
A0075507	P167	T61	Mix Tank	7/2011
A0075507	P231	T63	Mix Tank	8/2008
A0075507	P237	C48	Cowles Mixer-2HP	5/2023
A0075507	P232	T66	Mix Tank	8/2008
A0075507	P238	A3	1/2 HP Air Mixer	5/2023
A0075507	P239	A14	1/2 HP Air Mixer	5/2023
A0075507	P240	A15	1/2 HP Air Mixer	5/2023
A0075507	P241	Nano Air Mixer	1/2 HP Air Mixer	5/2023

Attachment 2

Affected Source Maps



COMMERCIAL

HZW Environmental Consultants

Signature   Date

FIRST FLOOR MAIN BUILDINGS

AKRON PAINT & VARNISH, INC.

1390 FIRESTONE PARKWAY
AKRON, OHIO

I:\2021\H21009\RY 2020 SERC\2020 Maps updated\H115085 SERC-AKRON 2021.dwg snelson Feb 18, 2021

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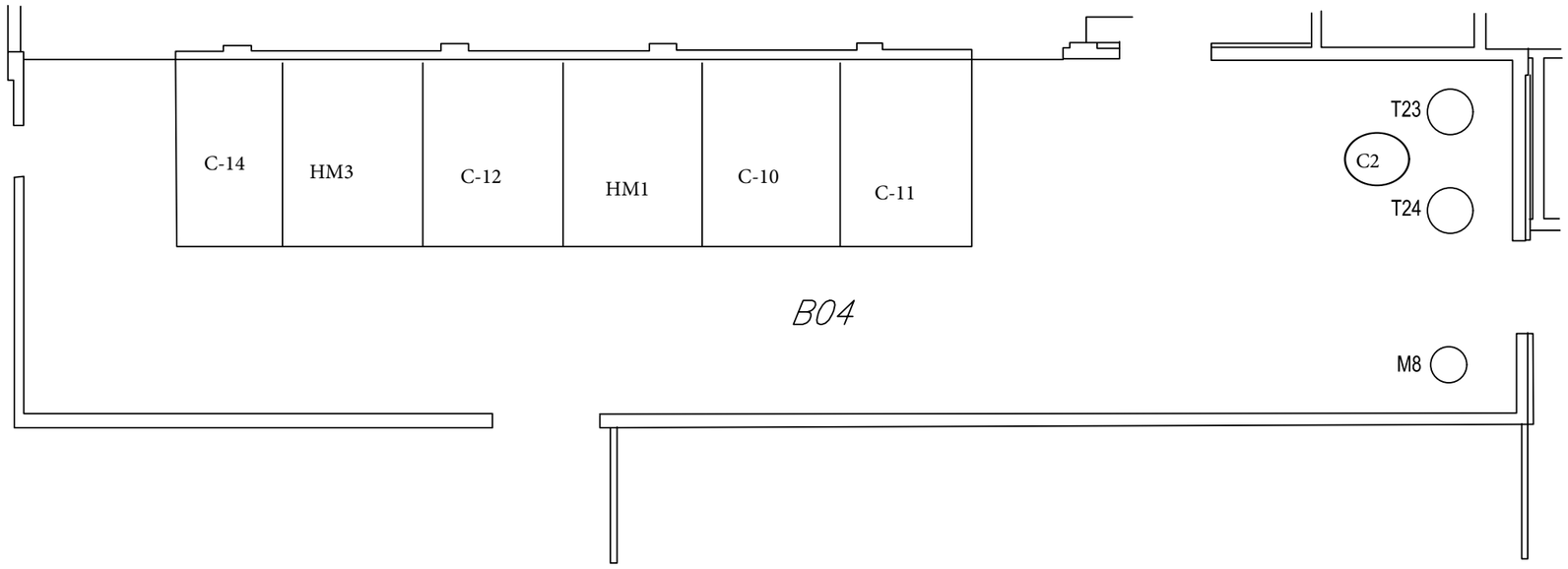
(APPROX.)



HZW Environmental Consultants

Signature Date

BUILDING 4

AKRON PAINT & VARNISH, INC.

1390 FIRESTONE PARKWAY
AKRON, OHIO

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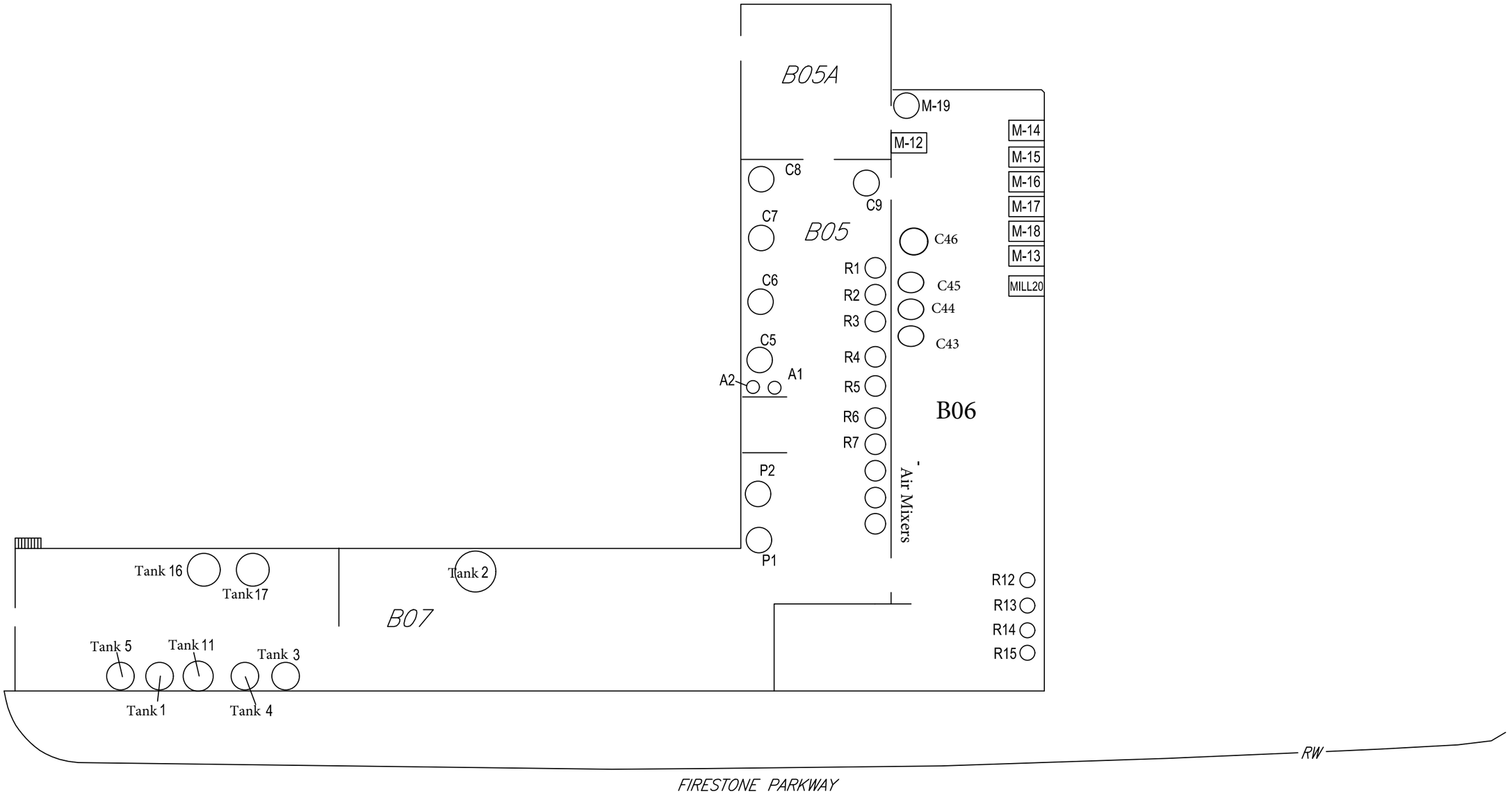
(APPROX.)



HZW Environmental Consultants

Signature

Date

BASEMENT, BUILDING 5, 6 AND 7

AKRON PAINT & VARNISH, INC.

1390 FIRESTONE PARKWAY
AKRON, OHIO

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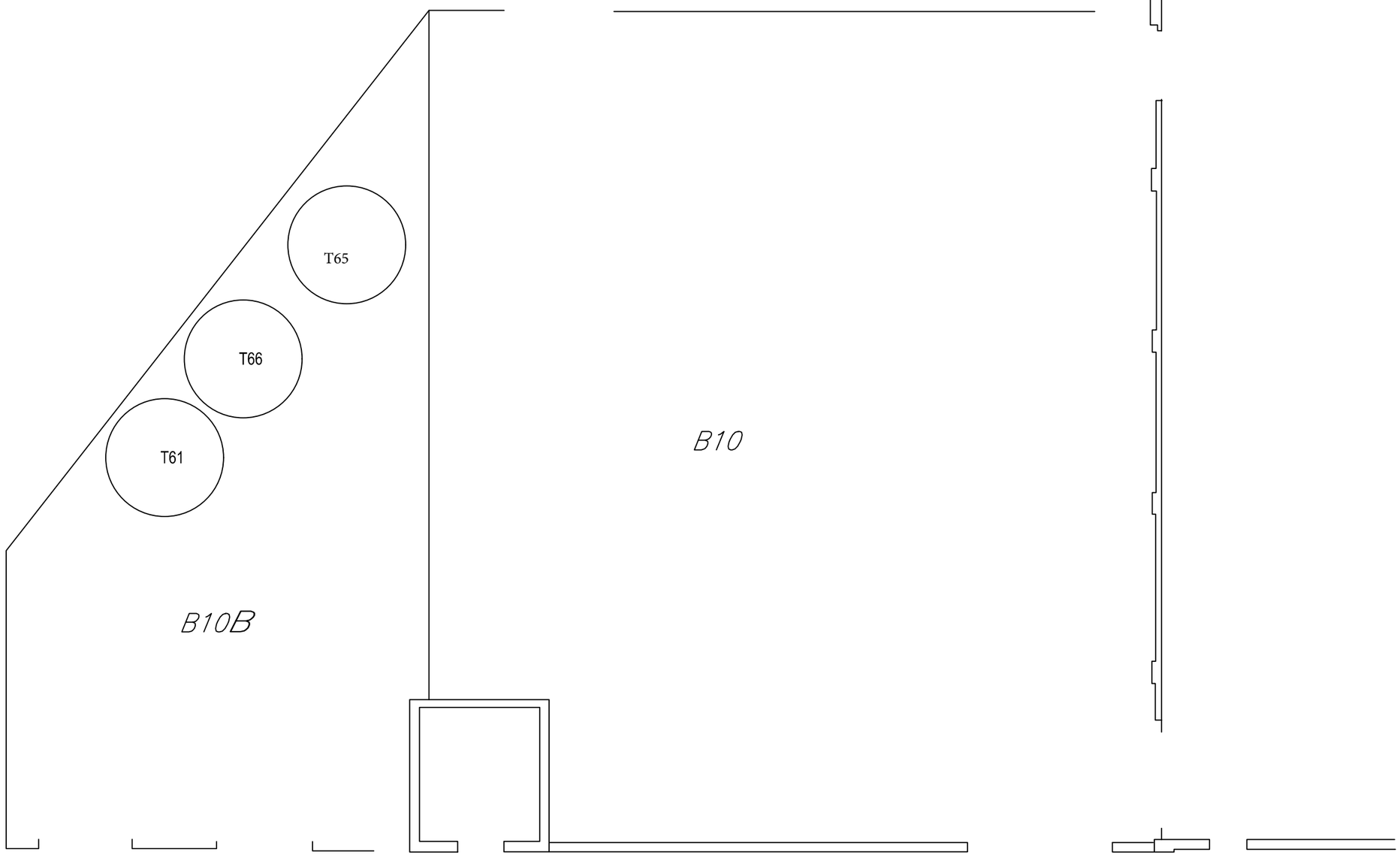
(APPROX.)



HZW Environmental Consultants

Signature

Date

BUILDING 10
AKRON PAINT & VARNISH, INC.
1390 FIRESTONE PARKWAY
AKRON, OHIO

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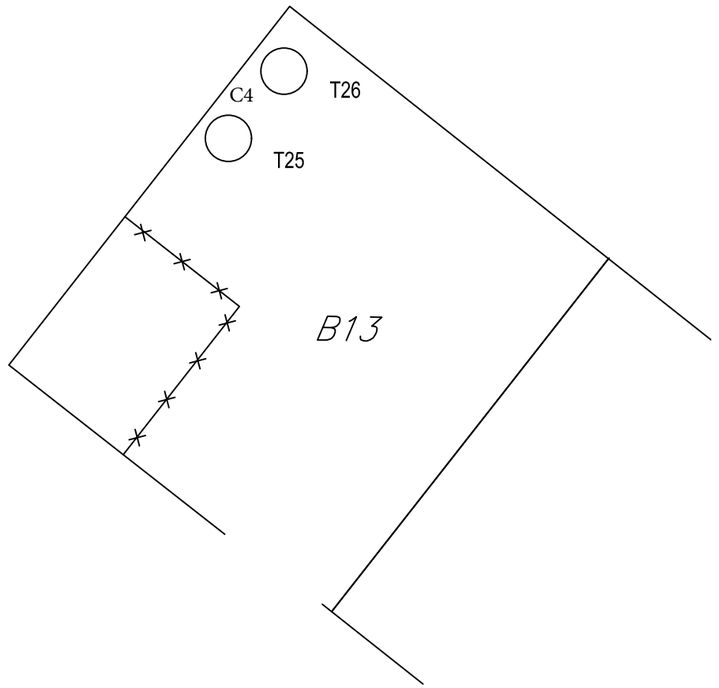
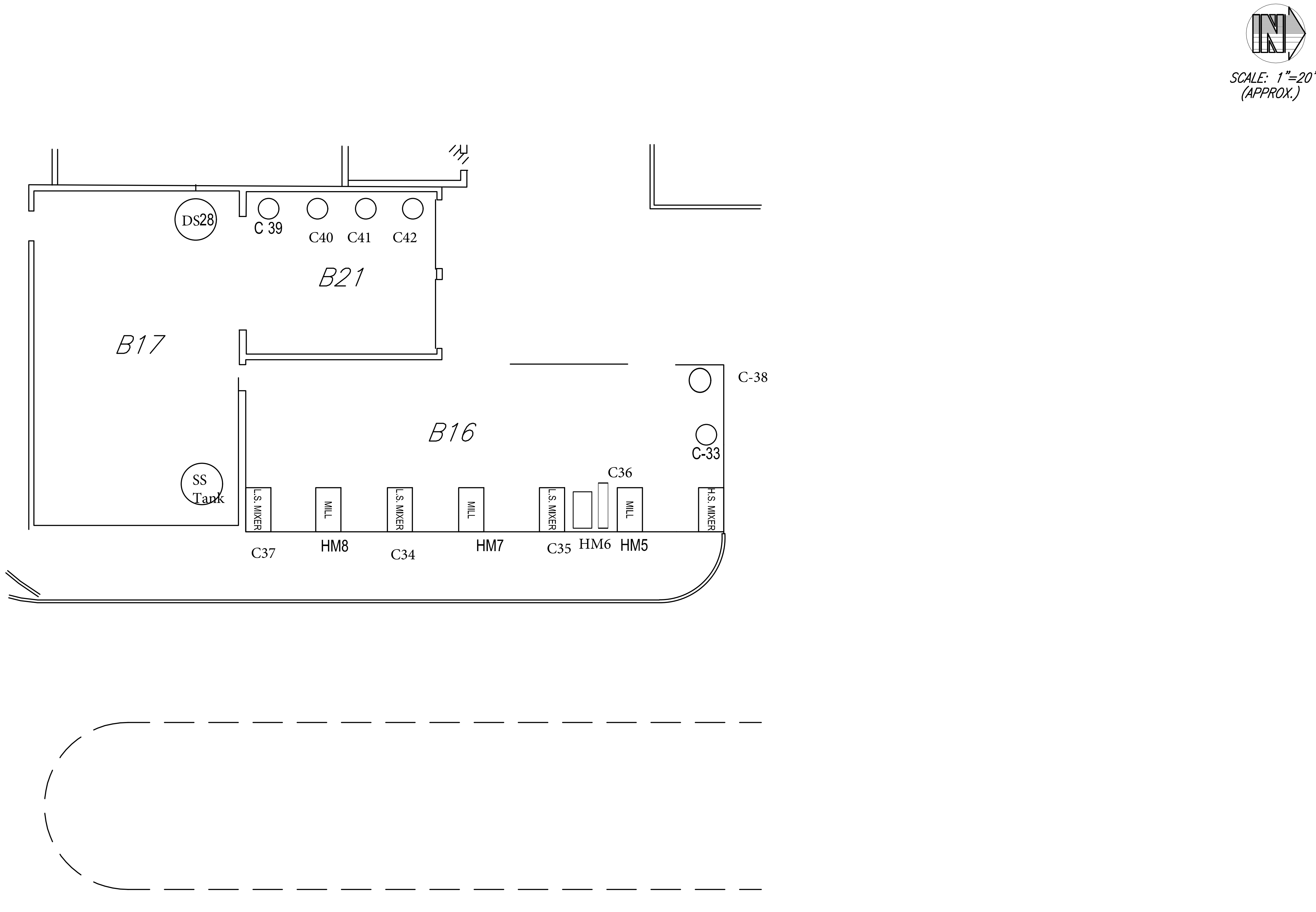
(APPROX.)



HZW Environmental Consultants

Signature Date

BUILDING 13
AKRON PAINT & VARNISH, INC.
1390 FIRESTONE PARKWAY
AKRON, OHIO



Signature
Date

BUILDINGS 16, 17 AND 21

AKRON PAINT & VARNISH, INC.

1390 FIRESTONE PARKWAY
AKRON, OHIO

HZW Environmental Consultants

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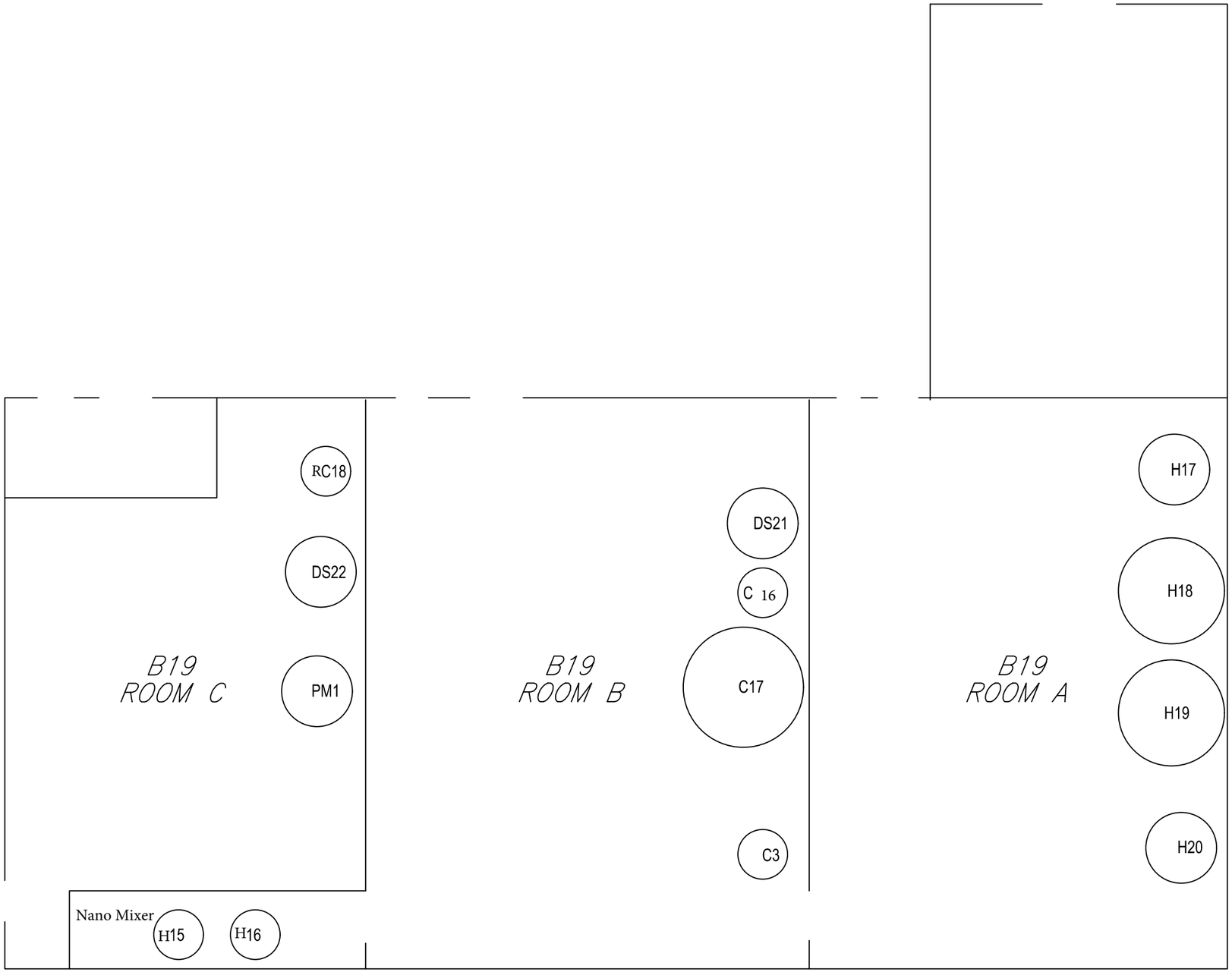
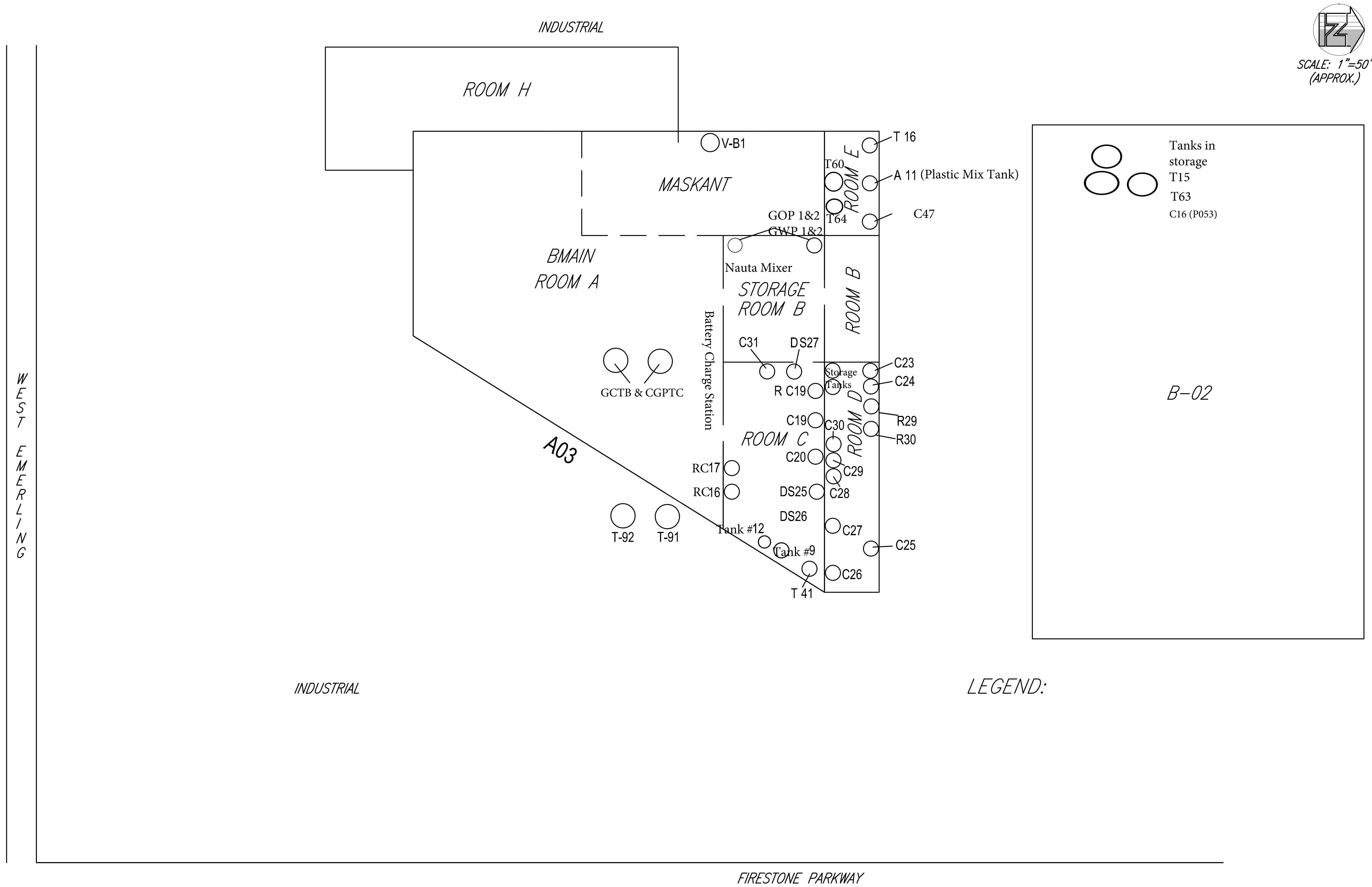


HZW Environmental Consultants

Signature Date

BUILDING 19
AKRON PAINT & VARNISH, INC.
1390 FIRESTONE PARKWAY
AKRON, OHIO



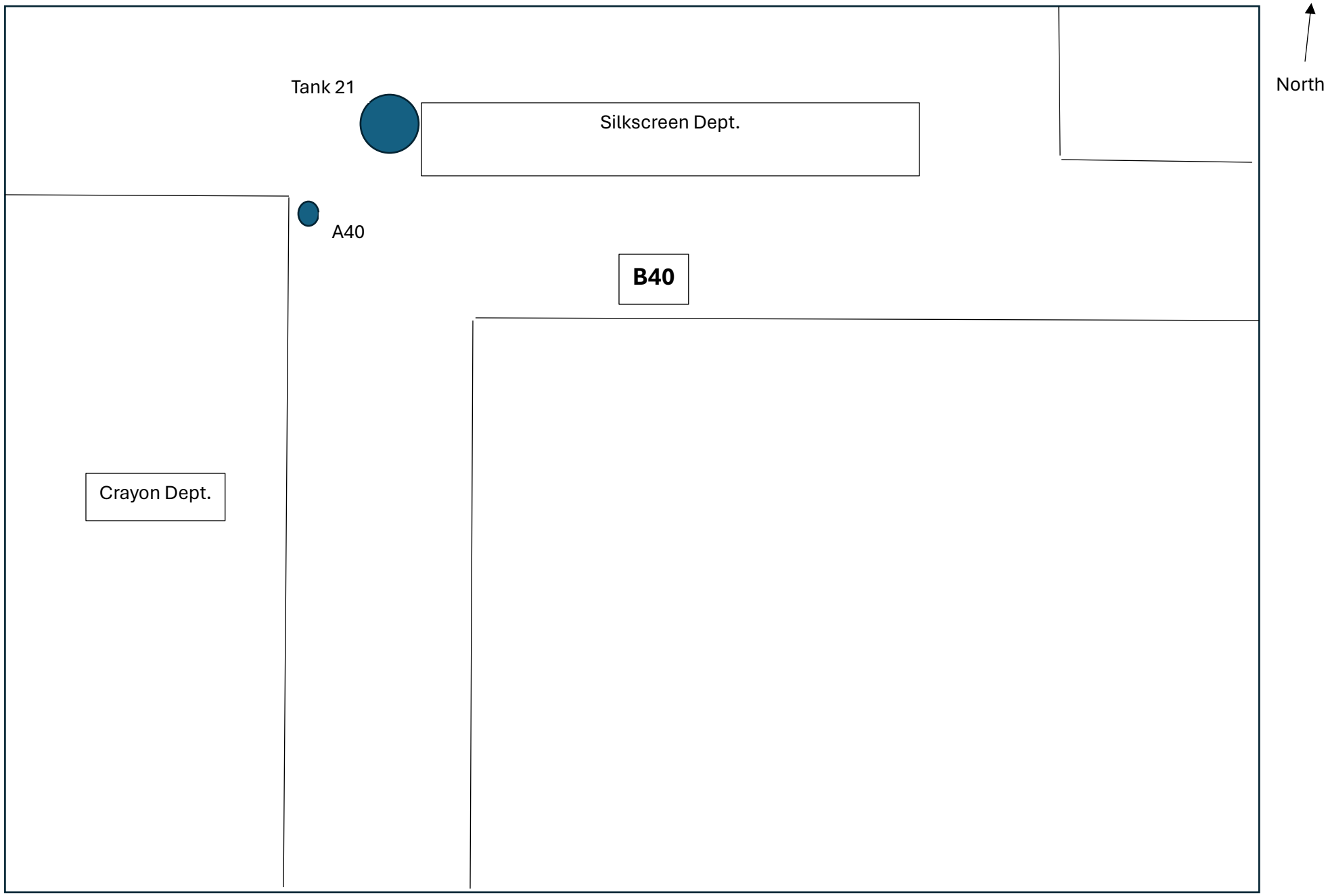
HZW Environmental Consultants

Signature Date

WAREHOUSE

AKRON PAINT & VARNISH, INC.

39 WEST EMERLING
AKRON, OHIO



APV Engineered Coatings
1390 Firestone Parkway
Akron, Ohio 44301

Attachment 3

12-Month Rolling VOC Workbook

ATTACHMENT 3

Facility-Wide 12-Month Rolling VOC

Notes:

As of June 2023, VOC emissions no longer need to be tracked for Tanks based on the PTE.

Month/Year	Mixing VOC (lbs)	Mill Wash VOC (lbs)	Tank VOC (lbs)	Can Cleaning VOC (lbs)	Silk Screen VOC (lbs)	Total VOC Emissions (lbs)	Total VOC Emissions (tons)	Rolling VOC Emissions (tons)
Jan-21	4744.48	345.98	95.75	45.79	35.76	5267.77	2.63	31.14
Feb-21	4382.61	345.98	109.17	40.39	24.38	4902.53	2.45	30.67
Mar-21	5967.79	345.98	178.54	46.87	29.21	6568.39	3.28	31.05
Apr-21	6763.98	579.79	259.91	38.66	44.41	7686.76	3.84	32.94
May-21	5264.59	579.79	326.77	36.94	21.39	6229.49	3.11	34.57
Jun-21	5321.51	579.79	406.81	41.26	54.54	6403.91	3.20	35.09
Jul-21	5645.82	585.34	422.22	32.94	107.85	6794.17	3.40	35.44
Aug-21	4866.29	585.34	361.69	36.72	6.76	5856.81	2.93	35.10
Sep-21	4914.88	585.34	273.23	39.42	73.89	5886.76	2.94	35.10
Oct-21	1664.92	721.73	196.59	34.56	73.82	2691.62	1.35	33.96
Nov-21	2494.86	721.73	120.08	34.78	116.95	3488.39	1.74	33.25
Dec-21	3733.34	721.73	87.35	26.78	24.88	4594.09	2.30	**33.19**
Jan-22	4582.33	344.50	96.09	36.72	13.49	5073.14	2.54	33.09
Feb-22	4549.20	344.50	530.07	35.86	85.47	5545.11	2.77	33.41
Mar-22	4774.61	344.50	179.49	38.45	17.17	5354.21	2.68	32.80
Apr-22	1563.70	844.03	252.86	38.66	81.18	2780.43	1.39	30.35
May-22	6167.37	844.03	344.88	39.31	20.14	7415.73	3.71	30.94
Jun-22	5932.07	844.03	407.52	38.66	32.93	7255.21	3.63	31.37
Jul-22	3408.74	345.36	411.17	32.40	79.97	4277.64	2.14	30.11
Aug-22	5381.69	345.36	372.64	38.77	59.89	6198.35	3.10	30.28
Sep-22	5112.46	345.36	270.14	36.50	14.23	5778.69	2.89	30.23
Oct-22	4604.75	549.65	198.35	42.55	0.00	5395.30	2.70	31.58
Nov-22	3617.44	549.65	114.75	28.51	46.82	4357.17	2.18	32.01
Dec-22	3516.73	549.65	92.23	34.78	63.00	4256.39	2.13	**31.84**
Jan-23	4513.54	314.49	62.53	31.93	85.74	5008.24	2.50	31.81
Feb-23	3328.44	314.46	74.94	30.71	41.83	3790.38	1.90	30.93
Mar-23	4084.49	314.46	113.57	40.07	69.13	4621.71	2.31	30.57
Apr-23	3110.87	318.35	184.65	24.61	42.55	3681.03	1.84	31.02
May-23	4417.72	318.35	252.82	32.34	5.76	5026.99	2.51	29.82
Jun-23	4549.33	318.35	NA	26.85	41.74	4936.27	2.47	28.66

ATTACHMENT 3

Facility-Wide 12-Month Rolling VOC

Jul-23	4007.86	449.30	NA	33.46	60.56	4551.17	2.28	28.80
Aug-23	4808.69	449.30	NA	39.15	41.07	5338.20	2.67	28.37
Sep-23	3752.31	449.30	NA	36.00	17.23	4254.84	2.13	27.61
Oct-23	4154.56	361.69	NA	31.73	84.79	4632.77	2.32	27.23
Nov-23	3786.80	361.69	NA	21.15	56.66	4226.30	2.11	27.16
Dec-23	2796.06	361.69	NA	21.76	2.13	3181.64	1.59	**26.62**

Attachment 4

Coating Information

ATTACHMENT 4
Coatings Information for PTE Calculations

Coating Name	Density (lbs/gal)	VOC (lbs/gal)	% VOC	Solid by Weight (%)	Solid by volume (%)	Solids (lb/gal)	Pigment by wieght (%)
A-8060 Gray Barrier Coating (Cowles)	7.22	5.38	75%	15%	10%	1.84	6%
IN-0426 (Water-based)	9.11	0.47	5%	36%	31%	8.64	NA
M-6323 (Reynolds Mixers)	7.2	5.42	75%	20%	15%	1.79	NA
DH-1611 (Air Mixers)	7.4	5.24	71%	29%	16%	NA	11%
M-1077B (Mills/Tanks)	8.77	5.75	66%	34%	23%	3.02	10%
R-4295 (GOJO Tanks)	8.15	0.21	3%	21%	23%	7.9	21%
P-3905 (Mix Tanks)	8.57	0.02	0.2%	8%	6%	8.55	8%
Mill Wash (T60)	7.506	6.19	83%	0%	0%	0	0%

Attachment 5

Clean Up Material Safety Data Sheets

SAFETY DATA SHEET

SOLVENT S100

SEP000000069

Version 4.0 Revision Date 2021/02/25 Print Date 2021/07/07

SECTION 1. IDENTIFICATION

Product name	: SOLVENT S100	100 Solvent
Synonyms	: Solvent S-100	
Product code	: 100142, 100069	

Manufacturer or supplier's details

SUNCOR ENERGY INC.
P.O. Box 2844, 150 - 6th Avenue South-West
Calgary Alberta T2P 3E3
Canada, Telephone: 1-866-786-2671

Emergency telephone number: CHEMTREC: 1-800-424-9300 (toll free) or +1 703-527-3887; Suncor Energy: +1 403-296-3000

Recommended use of the chemical and restrictions on use

Recommended use : Solvent.
Prepared by : Product Safety

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	liquid
Colour	Clear colorless
Odour	sweet

GHS Classification

Flammable liquids	: Category 3
Skin irritation	: Category 2
Eye irritation	: Category 2A
Carcinogenicity	: Category 2
Specific target organ toxicity - single exposure	: Category 3 (Respiratory system, Central nervous system)
Aspiration hazard	: Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Flammable liquid and vapour.
May be fatal if swallowed and enters airways.
Causes skin irritation.
Causes serious eye irritation.
May cause respiratory irritation.
May cause drowsiness or dizziness.
Suspected of causing cancer.

Precautionary statements : **Prevention:**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Keep container tightly closed.
Ground and bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting equipment.
Use non-sparking tools.
Take action to prevent static discharges.
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
IF SWALLOWED: Immediately call a POISON CENTER/doctor.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/ attention.
Do NOT induce vomiting.
If skin irritation occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
Take off contaminated clothing and wash it before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Storage:
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Disposal:
Dispose of contents/ container to an approved waste disposal plant.

Potential Health Effects

Primary Routes of Entry : Inhalation
Ingestion
Eye contact
Skin contact

Aggravated Medical Condition : None known.

Other hazards

None known.

IARC Group 28: Possibly carcinogenic to humans

Cumene 98-82-8

ACGIH No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

SECTION 3. COMPOSITIONIINFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration
Solvent naphtha (petroleum), light arom.; Low boilina ooint naohtha -unsoecified	64742-95-6	45- 58 %
1,2,4-trimethvlbenzene	95-63-6	30 - 35%
mesitvlene	108-67-8	10 - 15 %
1,2,3-trimethvlbenzene	526-73-8	2 - 4 %
cumene	98-82-8	<0.7%

All above concentrations are in percent by weight.

SECTION 4. FIRST AID MEASURES

If inhaled : Move to fresh air.
Artificial respiration and/or oxygen may be necessary.
Seek medical advice.

In case of skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Wash skin thoroughly with soap and water or use recognized skin cleanser.
Wash clothing before reuse.
Seek medical advice.

In case of eye contact : Remove contact lenses.
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Obtain meqical attention.

If swallowed	:	Rinse mouth with water. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Seek medical advice.
Most important symptoms and effects, both acute and delayed	:	Respiratory, skin and eye irritation; nausea; cancer. Inhalation of high vapour concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting. Inhalation may cause central nervous system effects. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.
Notes to physician	:	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Dry chemical Carbon dioxide (CO2) Water spray Water fog.
Unsuitable extinguishing media	:	Do NOT use water jet.
Specific hazards during firefighting	:	Cool closed containers exposed to fire with water spray.
Hazardous combustion products	:	Carbon oxides (CO, CO2), smoke and irritating vapours as products of incomplete combustion.
Further information	:	Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	For personal protection see section 8. Ensure adequate ventilation. Evacuate personnel to safe areas. Material can create slippery conditions.
Environmental precautions	:	If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	:	Prevent further leakage or spillage if safe to do so. Remove all sources of ignition. Soak up with inert absorbent material. Non-sparking tools should be used. Ensure adequate ventilation. Contact the proper local authorities.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling : For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Use only with adequate ventilation.
In case of insufficient ventilation, wear suitable respiratory equipment.
Avoid contact with skin, eyes and clothing.
Do not ingest.
Keep away from heat and sources of ignition.
Keep container closed when not in use.

Conditions for safe storage : Store in original container.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep in a dry, cool and well-ventilated place.
Keep in properly labelled containers.
To maintain product quality, do not store in heat or direct sunlight.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	GAS-No.	Value type (Form of exoosure)	Control parameters / Permissible concentration	Basis
Solvent naphtha (petroleum), light arom.; Low boiling point naphtha -unspecified	64742-95-6	TWA	200 mg/m3 (total hydrocarbon vaoor)	.CA AB OEL
		TWA	200 mg/m3 (total hydrocarbon vaoor)	ACGIH
1,2,4-trimethylbenzene	95-63-6	TWA	25 ppm 123 ma/m3	CAAB OEL
		TWAEV	25 ppm 123 ma/m3	CA QC OEL
		TWA	25 oom	CA BC OEL
		TWA	25 oom	ACGIH
mesitylene	108-67-8	TWA	25 ppm 123 ma/m3	CAAB OEL
		TWAEV	25 ppm 123 ma/m3	CAQC OEL
		TWA	25 oom	CA BC OEL
		TWA	25 oom	ACGIH
1,2,3-trimethylbenzene	526-73-8	TWA	25 ppm 123 ma/m3	CAAB OEL
		TWAEV	25 ppm 123 ma/m3	CA QC OEL
		TWA	25 oom	CA BC OEL
		TWA	25 onm	ACGIH
cumene	98-82-8	TWA	50 ppm 246 mo/m3	CAAB OEL
		TWA	25 oom	CA BC OEL
		STEL	75 oom	CA BC OEL
		TWAEV	50ppm 246 mo/m3	CA QC OEL

	TWA	50 ppm	ACGIH

Engineering measures : Adequate ventilation to ensure that Occupational Exposure Limits are not exceeded.
Use only in well-ventilated areas.
Ensure that eyewash station and safety shower are proximal to the work-station location.

Personal protective equipment

Respiratory protection : Concentration in air determines protection needed.
Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Filter type : A NIOSH-approved air-purifying respirator with an organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection

Material : polyvinyl alcohol (PVA), Viton(R). Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.

Remarks : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eye protection : Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.

Protective measures : Wash contaminated clothing before re-use.

Hygiene measures : Remove and wash contc;1minated clothing and gloves, including the inside, before re-use.
Wash face, hands and any exposed skin thoroughly after handling.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Colour : Clear colorless

Odour	:	sweet
Odour Threshold	:	2 ppm
pH	:	No data available
Melting point	:	No data available
Boiling poinUboiling range	:	163.3 - 170.3 °C (325.9 - 338.5 °F)
Decomposition temperature		No data available
Flash point	:	41.7 °C (107.1 °F) Method: Pensky-Martens closed cup
Auto-Ignition Temperature	:	No data available
Evaporation rate	:	No data available
Flammability	:	Combustible, avoid open flames, sparks, static discharge and intense heat.
Upper explosion limit	:	No data available
Lower explosion limit	:	No data available
Vapour pressure	:	approximately 0.8 kPa (38 °C / 100 °F)
Relative vapour density	:	**4** **Air= 1**
Relative density	:	0.873 (15.56 °C / 60.01 °F)
Solubility(ies)		
Solubility in other solvents	:	Easily soluble in, diethyl ether, acetone, methanol, Partially soluble in, n-octane, Insoluble in, cold water, hot water
Partition coefficient: n-octanol/water	:	No data available
Viscosity		
Viscosity, dynamic	:	approximately 0.7 mPa.s (38 °C)
Viscosity, kinematic	:	No data available
Molecular weight	:	approximately 120 g/mol

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reac-	:	Hazardous polymerisation does not occur.

tions
Conditions to avoid : Heat, flames and sparks.
Extremes of temperature and direct sunlight.
Incompatible materials : Reactive with oxidising agents and acids.
Hazardous decomposition products : May release COx, NOx, smoke and irritating vapours when heated to decomposition.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure
Inhalation
Ingestion
Eye contact
Skin contact

Acute toxicity

Product:

Acute oral toxicity : Remarks: Based on available data, the classification criteria are not met.

Acute inhalation toxicity : Remarks: Based on available data, the classification criteria are not met.

Acute dermal toxicity : Remarks: Based on available data, the classification criteria are not met.

Components:

Solvent naphtha (petroleum), light arom.; Low boiling point naphtha -unspecified:
Acute oral toxicity : LOSO (Rat): 8,400 mg/kg,

1,2,4-trimethylbenzene:
Acute oral toxicity : LOSO (Rat): > 5,000 mg/kg,

Acute inhalation toxicity : LCS0 (Rat): 18 mg/l
Exposure time: 4 h
Test atmosphere: vapour

Acute dermal toxicity : LOSO (Rabbit): 3,160 mg/kg,

mesitylene:
Acute oral toxicity : LOSO (Rat): 5,000 mg/kg,

LOSO (Mouse): 7,000 mg/kg,

Acute inhalation toxicity : LCS0 (Rat): 24 mg/l
Exposure time: 4 h
Test atmosphere: vapour

cumene:
Acute oral toxicity : LOSO (Rat): 2,910 mg/kg,

Acute inhalation toxicity : LCS0 (Rat): 8000 ppm
Exposure time: 4 h

Test atmosphere: vapour

Acute dermal toxicity : LOSO (Rabbit): 10,627 mg/kg,

Skin corrosion/irritation

Product:
Remarks: Causes skin irritation.

Serious eye damage/eye irritation

Product:
Remarks: Causes serious eye irritation.

Respiratory or skin sensitisation

Product:
Remarks: Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Product:

Germ cell mutagenicity-Assessment	Based on available data, the classification criteria are not met.

Carcinogenicity

Product:

Carcinogenicity - Assessment	Suspected of causing cancer.

Reproductive toxicity

Product:

Reproductive toxicity - Assessment	Based on available data, the classification criteria are not met.

STOT - single exposure

Product:
Target Organs: Respiratory system, Central nervous system
Remarks: May cause respiratory irritation.
May cause drowsiness or dizziness.

STOT - repeated exposure

Product:
Remarks: Based on available data, the classification criteria are not met.

No data available

Aspiration toxicity

Product:

May be fatal if swallowed and enters airways.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish	:	Remarks: No data available
Toxicity to daphnia and other aquatic invertebrates	:	Remarks: No data available
Toxicity to algae	:	Remarks: No data available
Toxicity to bacteria	:	Remarks: No data available

Persistence and degradability

Product:

Biodegradability	:	Remarks: No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	The product should not be allowed to enter drains, water courses or the soil. Offer surplus and non-recyclable solutions to a licensed disposal company. Waste must be classified and labelled prior to recycling or disposal. Send to a licensed waste management company. Dispose of as hazardous waste in compliance with local and national regulations. Dispose of product residue in accordance with the instructions of the person responsible for waste disposal.
Contaminated packaging	:	Contact local or business unit authorities for guidance on disposal of product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 1268
Proper shipping name	:	Petroleum distillates, n.o.s.
Class	:	3
Packing group	:	III
Labels	:	Class 3 - Flammable Liquid
Packing instruction (cargo aircraft)	:	366

IMDG-Code

UN number	:	UN 1268
Proper shipping name	:	PETROLEUM DISTILLATES, N.O.S.
Class	:	3
Packing group	:	111
Labels	:	3
EmS Code	:	F-E, S-E
Marine pollutant	:	yes

Transport in bulk according to Annex II of MARPOL 7Jn8 and the IBC Code

National Regulations

TDG

UN number	:	UN 1268
Proper shipping name	:	PETROLEUM DISTILLATES, N.O.S.
Class	:	3
Packing group	:	III
Labels	:	3
ERG Code	:	128
Marine pollutant	:	yes

SECTION 15. REGULATORY INFORMATION

This product has been classified according to the hazard criteria of the Hazardous Products Regulations (HPR) and the SOS contains all of the information required by the HPR.

The components of this product are reported in the following inventories:

DSL All components of this product are on the Canadian DSL

SECTION 16. OTHER INFORMATION

Prepared by	:	Product Safety
Revision Date	:	2021/02/25

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

SAFETY DATA SHEET

1. Product and Company Identification

Product Name: MASK WASH
Product Code: RCMW **Chemical Type: Solvent Blend**
Product Use: Clean-up and dilution of solvent based paint and ink.

Manufacturer: Chemical Solvents Inc.
Address: 3751 Jennings Rd.
Cleveland, Ohio 44109

Revision Date: 1/15/2020
Emergency: Chemtrec (800) 424-9300
Phone: (800) 362-0693

NOTE: The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. Chemical Solvents Inc provides this information as guidance for providing personal protection to your employees. The user has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. The user must meet all applicable safety and health standards.

2. Hazards Identification

Emergency Overview
Form: Liquid Physical state: Liquid Color: Colorless Odor: Mild, Hydrocarbon
OSHA Hazards : Flammable Liquid, Harmful by skin absorption., Reproductive hazard

EXPOSURE PREVENTION: STRICT HYGIENE!
AVOID EXPOSURE OF (PREGNANT) WOMEN, ADOLESCENTS, CHILDREN!

GHS Classification:
Flammable liquids, Category 2
Skin irritation, Category 2
Reproductive toxicity, Category 2
Specific target organ systemic toxicity - single exposure,
Category 3, Respiratory system, Central nervous system
Specific target organ systemic toxicity - repeated exposure,
Category 2, Nervous system
Aspiration hazard, Category 1
Acute aquatic toxicity, Category 2
Chronic aquatic toxicity, Category 2

GHS-Labeling
Symbol(s) :

Signal Word : Danger

Hazard Statements :
H225: Highly flammable liquid and vapor.
H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.
H335: May cause respiratory irritation.
H336: May cause drowsiness or dizziness.
H361: Suspected of damaging fertility or the unborn child.
H373: May cause damage to organs (Nervous system) through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

Precautionary Statements: Prevention:
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233: Keep container tightly closed.
P240: Ground/bond container and receiving equipment.
P241: Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242: Use only non-sparking tools.
P243: Take precautionary measures against static discharge.
P260: Do not breathe dust/fume/gas/mist/vapor/spray.
P264: Wash skin thoroughly after handling.
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.

Target Organs: Eyes, Skin, Respiratory system, Central nervous system, Heart

Aggravated Medical Condition: Skin disorders, Eye disorders, Cardiac irregularities, Respiratory disorders, Asthma

NOTICE: Reports have associated repeated and prolonged OVEREXPOSURE to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents of this package may be harmful or fatal.

3. Composition / Information on Ingredients

Ingredients	CAS #	Percent
Methanol	67-56-1	0-15%
Acetone	67-64-1	45-60%
Toluene	108-88-3	0-20%
Methyl Ethyl Ketone	78-93-3	0-20%
Methyl Isobutyl Ketone	108-10-1	0-15%
Light Aliphatic Naphtha	64742-89-8	0-10%
Xylene	1330-20-7	5-25%
Butanol	71-36-3	0-10%
Butyl Acetate	123-86-4	0-10%
2-Butoxy Ethanol	111-76-2	0-10%
Ethyl Benzene	100-41-4	0-10%
Ethyl Acetate	141-78-6	0-10%
1-Methoxy-2-Propanol Acetate	*108-65-6*	0-10%
Aromatic Petroleum Distillates**	64742-95-6	0-10 %
METHYL ACETATE	79-20-9	0-20%

**Aromatic Distillates may contains 7% Xylene (1330-20-7), 3% cumene (98-82-8), 20% 1,2,4 Trimethylbenzene (95-63-6) which are subject to the reporting requirements of SARA 313.
NOTE: This is a recycled product. The ingredients and their amounts may change from batch to batch.

4. First Aid Measures

Take proper precautions to ensure your own health and safety before attempting rescue or providing first aid.

Eye Contact:
Check for and remove contact lenses. If irritation or redness develops, flush eyes with cool, clean, low-pressure water for at least 15 minutes. Hold eyelids apart to ensure complete irrigation of the eye and eyelid tissue. Do not use eye ointment. Seek medical attention immediately.

Skin Contact:
Remove contaminated shoes and clothing. Flush affected area with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. Do not use ointments. If skin surface is not damaged, clean affected area thoroughly with mild soap and water. Seek medical attention if tissue appears damaged or if pain or irritation persists.

Inhalation:
Immediately move victim to fresh air. If victim is not breathing, immediately begin rescue breathing. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). If breathing is difficult, 100 percent humidified oxygen should be administered by a qualified individual. Seek medical attention immediately.

Ingestion:
Do not induce vomiting. If spontaneous vomiting is about to occur, place victim's head below knees. If victim is drowsy or unconscious, place on the left side with head down. Never give anything by mouth to a person who is not fully conscious. Do not leave victim unattended. Seek medical attention immediately.

Note to Physician:
INHALATION: Inhalation overexposure can produce toxic effects. Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for upper respiratory tract inflammation, bronchitis, and pneumonitis. Administer supplemental oxygen with assisted ventilation, as required.

This material (or a component) sensitizes the heart to the effects of sympathomimetic amines. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in individuals exposed to this material. Administion of sympathomimetic drugs should be avoided.

INGESTION: If ingested, this material presents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended. Consider activated charcoal and/or gastric lavage. If patient is obtunded, protect the airway by cuffed endotracheal intubation or by placement of the body in a Trendelenburg and left lateral decubitus position.

5. Fire Fighting Measures

Flash Point: 0 F (TCC) lowest component
Flammable limits in air, % by volume:
Upper: No Information **Lower:** No Information

Extinguishing Media:
SMALL FIRE: Use dry chemicals, carbon dioxide, foam, water fog, or inert gas (nitrogen).
LARGE FIRE: Use foam, water fog, or water spray. Water fog and spray are effective in cooling containers and adjacent structures. However, water can cause frothing and/or may not extinguish the fire. Water can be used to cool the external walls of vessels to prevent excessive pressure, autoignition or explosion. DO NOT use a solid stream of water directly on the fire as the water may spread the fire to a larger area.

Unusual Fire & Explosion Hazards:
Flammable Liquid! This material releases vapors at or below ambient temperatures. When mixed with air in certain proportions and exposed to an ignition source, its vapor can cause a flash fire. Use only with adequate ventilation. Vapors are heavier than air and may travel long distances along the ground to an ignition source and flash back. A vapor and air mixture can create an explosion hazard in confined spaces such as sewers. If container is not properly cooled, it can rupture in the heat of a fire.

Special Fire Fighting Procedures:
Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies. Evacuate area and fight the fire from a maximum distance or use unmanned hose holders or monitor nozzles. Cover pooling liquid with foam. Containers can build pressure if exposed to radiant heat; cool adjacent containers with flooding quantities of water until well after the fire is out. Withdraw immediately from the area if there is a rising sound from a venting safety device or discoloration of vessels, tanks, or pipelines. Be aware that burning liquid will float on water. Notify appropriate authorities if liquid enter sewers or waterways.

6. Accidental Release Measures

Take proper precautions to ensure your own health and safety before attempting spill control or clean-up.

Spill or Leak Instructions
Contain spill with dikes of soil or nonflammable absorbent to minimize contaminated area. Avoid run-off into storm sewers and ditches leading to waterways. If required, notify state and local authorities. Place leaking containers in well-ventilated area. Clean up small spills by using a nonflammable absorbent or flushing sparingly with water. Contain larger spills with nonflammable diking or absorbent. Clean up by vacuuming or sweeping.

Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. Assess the spill situation, as the spill may not evolve large amounts of hazardous airborne contaminants in many outdoor spill situations. It may be advisable in some cases to simply monitor the situation until spilled product is removed.

7. Handling and Storage

Handling: FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN

A spill or leak can cause an immediate fire or explosion hazard. Keep containers closed and do not handle or store near heat, sparks, or any other potential ignition sources. Do not contact with oxidizable materials. Do not breathe vapor. Use only with adequate ventilation and personal protection. Never siphon by mouth. Avoid contact with eyes, skin, and clothing. Prevent contact with food and tobacco products. Do not take internally.

When performing repairs and maintenance on contaminated equipment, keep unnecessary persons away from the area. Eliminate all potential ignition sources. Drain and purge equipment, as necessary, to remove material residues. Use gloves constructed of impervious materials and protective clothing if direct contact is anticipated. Provide ventilation to maintain exposure potential below applicable exposure limits. Promptly remove contaminated clothing. Wash exposed skin thoroughly with soap and water after handling.

Empty containers may contain material residues which can ignite with explosive force. Misuse of empty containers can be dangerous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers can cause fire, explosion, or release of toxic fumes from residues. Do not pressurize or expose empty containers to open flame, sparks, or heat. Keep container closed and drum bungs in place. All label warnings and precautions must be observed. Return empty drums to a qualified reconditioner. Consult appropriate federal, state and local authorities before reusing, reconditioning, reclaiming, recycling, or disposing of empty containers and/or waste residues of this material.

Storage:
Store and transport in accordance with all applicable laws. Keep containers tightly closed and store in a cool, dry, well-ventilated place, plainly labeled, and out of closed vehicles. Keep away from all ignition sources. Ground all equipment containing this material. Containers should be able to withstand pressures expected from warming and cooling in storage. This flammable liquid should be stored in a separate safety cabinet or room. All electrical equipment in areas where this material is stored or handled should be installed in accordance with applicable regulatory requirements and the National Electrical Code.

8. Exposure Controls / Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor or mists below the applicable workplace exposure limits indicated below. All electrical equipment should comply with the National Electric Code. An emergency eye wash station and safety shower should be located near the work-station.

Personal Protective Equipment

Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations.

Eye Protection
Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. Chemical goggles should be worn during transfer operations or when there is a likelihood of misting, splashing, or spraying of this material. Suitable eye wash water should be readily available.

Hand Protection
Avoid skin contact. Use chemical resistant gloves. Wash hands with plenty of mild soap and water before eating, drinking, smoking, use of toilet facilities or leaving work. DO NOT use gasoline, kerosene, solvents or harsh abrasives as skin cleaners.

Body Protection
Avoid skin contact. Wear long-sleeved fire-retardant garments (e.g., Nomex®) while working with flammable and combustible liquids. Additional chemical-resistant protective gear may be required

if splashing or spraying conditions exist. This may include an apron, boots and additional facial protection. If product comes in contact with clothing, immediately remove soaked clothing and shower. Promptly remove and discarded contaminated leather goods.

Respiratory Protection:
Based on workplace contaminant level and working limits of the respirator, use a respirator approved by NIOSH. The following is the minimum recommended equipment for an occupational exposure level.

For concentrations > 1 and < 10 times the occupational exposure level: Use air-purifying respirator with full facepiece and organic vapor cartridge(s) or air-purifying full facepiece respirator with an organic vapor canister or a full facepiece powered air-purifying respirator fitted with organic vapor cartridge(s). The air purifying element must have an end of service life indicator, or a documented change out schedule must be established. Otherwise, use supplied air.

For escape: Use self-contained breathing apparatus with full facepiece or any respirator specifically approved for escape.

General Comments
Warning! Use of this material in spaces without adequate ventilation may result in generation of hazardous levels of combustion products and/or inadequate oxygen levels for breathing. Odor is an inadequate warning for hazardous conditions.

Other Suggested Equipment:
Eye wash station and emergency showers should be available. Spill containment equipment should be available.

Discretion Advised:
Chemical Solvents Inc. takes no responsibility for determining what measures are required for personal protection in any specific application. The general information should be used with discretion.

Exposure guidelines:

Ingredients	CAS #	Percent	Exposure Limits
*Methanol	67-56-1	0-15%	OSHA (PEL)- 200 ppm (skin) OSHA (PEL)- 250 ppm (skin) STEL ACGIH (TWA)- 200 ppm (skin) ACGIH (TWA)- 200 ppm (skin)
Acetone	67-64-1	45-60%	OSHA (TWA)- 1000 ppm ACGIH (TLV)- 500 ppm
*Toluene	108-88-3	0-20%	OSHA (TWA)- 200 ppm ACGIH (TLV)- 50 ppm
*Methyl Ethyl Ketone	78-93-3	0-20%	OSHA (TWA)- 200 ppm ACGIH (TLV)- 200 ppm
*Methyl Isobutyl Ketone	108-10-1	0-15%	OSHA (TWA)- 100 ppm ACGIH (TLV)- 50 ppm
Light Aliphatic Naphtha	64742-89-8	0-10%	OSHA (TWA)- 400 ppm ACGIH (TLV)- N/E
*Xylene	1330-20-7	5-25%	OSHA (TWA)- 100 ppm ACGIH (TLV)- 100 ppm

Butanol	71-36-3	0-10%	OSHA (TWA)- 100 ppm ACGIH (ceiling)- 20 ppm
Butyl Acetate	123-86-4	0-10%	OSHA (TWA)- 150 ppm ACGIH (TWA)- 150 ppm
*2-Butoxy Ethanol	111-76-2	0-10%	OSHA (TWA)- 50 ppm ACGIH (TLV)- 20 ppm
*Ethyl Benzene	100-41-4	0-10%	OSHA (TWA)- 100 ppm ACGIH (TLV)- 100 ppm
Ethyl Acetate	141-78-6	0-10%	OSHA (TWA)- 400 ppm ACGIH (TWA)- 400 ppm
1-Methoxy-2-Propanol Acetate	*108-65-6*	0-10%	OSHA (TWA)- N/E ACGIH (TWA)- N/E
Aromatic Petroleum Distillates**	64742-95-6	0-10 %	OSHA (TWA)- 50 ppm ACGIH (TLV)- N/A
METHYL ACETATE	79-20-9	0-20%	OSHA (TWA)- 200 ppm ACGIH (TLV)- 200 ppm

**Aromatic Distillates may contains 7% Xylene (1330-20-7), 3% cumene (98-82-8), 20% 1,2,4 Trimethylbenzene (95-63-6) which are subject to the reporting requirements of SARA 313.
NOTE: This is a recycled product. The ingredients and their amounts may change from batch to batch.

9. Physical and Chemical Properties

Appearance (physical state, color, etc.): clear, colorless to straw liquid
Odor: Mild Ketone
pH: N/A
Initial boiling point and boiling range : 180 F - N/A
Evaporation Rate: >1 (NBA=1)
Upper/Lower Flammability or explosive limits: N/A
Vapor Pressure: 241 hPa at 20 °C(68 °F)(acetone)
Vapor Density: >1(Air=1)
Auto-ignition temperature: 465 °C (Acetone)
Partition coefficient: n-octanol/water: N/A
Odor Threshold: N/A
Melting/Freezing Point: N/A
Flash Point: 0 F (TCC)
Flammability (solid, gas): N/A
Solubility: partial in water
Viscosity: N/A
Relative Density: 0.813
Decomposition Temperature: N/A

10. Stability and Reactivity

Stability: Stable **Conditions to Avoid**: Heat, spark, and open flame
Incompatibility: Strong Oxidizing Agents
Hazardous Decomposition: Combustion will produce Carbon Monoxide, Carbon Dioxide and nitrogen-oxygen compounds.
Hazardous Polymerization: Will not occur

11. Toxicological Information

Acetone

Inhalation. LC50:	>50000 mg/m3 – rats – 8 hrs.
Oral LD50:	5.8 g/kg – rats
Skin absorption LD50:	20000 mg/kg – rabbits

Methanol

Acute Exposure: Toxicity information on the solution is generally not available. Information on the solution components is listed next.

Oral LD50: 6.2-12.9g/kg (rats); practically nontoxic to animals. However, based on human exposure reports, a small amount (usually two or more ounces) can cause mental sluggishness, nausea and vomiting leading to severe illness, and may produce adverse effects on vision with possible blindness or death if treatment is not received.

Inhalation LC50: 64000ppm (rats,4 hrs.); practically nontoxic to animals. Based on human exposure reports, levels substantially above the TLV cause stupor, headache, nausea, dizziness, unconsciousness and may produce adverse effects on vision.

Skin: Irritating to rabbit skin. Severity depends on the quantity administered and exposure period and is related to the defatting properties of methanol; slightly toxic to animals (minimum lethal dose, monkeys: 1.6g/kg; LD50, rabbits:16g/kg). Based on human exposure reports, prolonged and repeated skin contact with methanol-soaked material has produced toxic effects including vision effects and death.

Eye: Severely irritating to rabbit eyes.

Mutagenicity: Methanol - Not genotoxic in most in vitro assays. Not genotoxic in vivo in mice exposed via inhalation up to 4000ppm (6hrs./day for 5 days) and subsequently examined for cytogenetic effects.

Carcinogenicity: Methanol - Inhalation-Not carcinogenic in lifetime inhalation studies (reported in limited detail) in rats and mice at concentrations of 10-1000ppm. Dermal-Not carcinogenic in mice exposed dermally to 0.02ml/day, 2 days/week over a lifetime in a study of limited quality.

Reproductive/Developmental Effects: Methanol - In an inhalation developmental toxicity study, rats were exposed 6hrs./day to 5000, 10000 or 20000ppm vapors. A significant teratogenic response

Toluene

Toluene contains small amounts of benzene a known carcinogen which may produce blood changes which include reduced platelets, reduced red blood cells, reduced white blood cells, aplastic anemia, and acute nonlymphocytic anemia. Toluene contains small amounts of Ethylbenzene and Xylene, both have been related to fetotoxicity, liver and kidney injury. Exposure of pregnant rats during gestation to toluene at levels of 250 ppm or higher has produced some maternal toxicity and embryo/fetotoxicity. A lifetime inhalation study in rats did not show any toxic effects even at a high dose of 300 ppm. Behavioral signs of hearing loss were observed in rats exposed to toluene subchronically at levels of 1000 ppm or more. Toluene has an IARC rating of 3.

Chemical Name: **BENZENE** CAS: 71-43-2 < 1.0%
0.5 ppm ACGIH TWA
2.5 ppm ACGIH STEL

1 ppm OSHA PEL
5 ppm OSHA CEILING
10 LBS CERCLA 302.4 RQ

Chemical Name: **BENZENE, ETHYL** CAS: 100-41-4 < 1.0%
100 ppm ACGIH TWA
125 ppm ACGIH STEL
100 ppm OSHA PEL
1,000 LBS CERCLA 302.4 RQ

Chemical Name: **Xylene, all isomers** traces
ACGIH (United States).
TWA: 100 ppm 8 hour(s).
STEL: 150 ppm 15 minute(s).
OSHA (United States).
TWA: 100 ppm 8 hour(s).

	Aromatic Petroleum Distillates
Inhalation. LC50:	No Data
Oral LD50:	No Data
Dermal LD50:	No Data

Hours of exposure to high concentrations of cumene, a minor component of Aromatic Petroleum Distillates, has produced kidney, spleen and liver damage in laboratory animals.

XYLENE

PRE-EXISTING MEDICAL CONDITIONS
The following diseases or disorders may be aggravated by exposure to this product: skin, eye, liver, kidney, nervous system, respiratory system, lung (asthma-like conditions),

INHALATION
High concentrations may lead to central nervous system effects (drowsiness, dizziness, nausea, headaches, paralysis and loss of consciousness and even death). Repeated overexposure has caused a hearing loss in laboratory animals. Repeated overexposure has produced toxic effects in developing and young laboratory animals. Solvent "huffing/sniffing" (abuse) or intentional prolonged overexposure to high levels of vapors can produce abnormal behavior, convulsions, hallucinations, delerium, nervous system damage, serious disturbances of heart rhythm and sudden death. Prolonged or repeated exposure may cause liver and kidney damage.

LC50 (ppm): 26800

SKIN
May be absorbed through the skin in harmful amounts. Prolonged or repeated contact can result in defatting and drying of the skin which may result in skin irritation and dermatitis (rash). Prolonged or repeated skin contact may cause irritation.

Draize Skin Score: no data Out of 8.0
LD50 (mg/kg): 2000

EYES Causes eye irritation.

INGESTION
Moderately toxic. Irritating to mouth, throat, and stomach. May produce central nervous system effects, which may include dizziness, loss of balance and coordination, unconsciousness, coma and even death. Product may be harmful or fatal if swallowed. Pulmonary aspiration hazard. After ingestion, may enter lungs and produce damage.

LD50 (g/kg): 4.3

Xylene contains small amounts of benzene a known carcinogen which may produce blood changes which include reduced platelets, reduced red blood cells, reduced white blood cells, aplastic anemia, and acute nonlymphocytic anemia. Xylene contains Ethylbenzene, both have been related to fetotoxicity, liver and kidney injury. Exposure of pregnant rats during gestation to toluene at levels of 250 ppm or higher has produced some maternal toxicity and embryo/fetotoxicity. A lifetime inhalation study in rats did not show any toxic effects even at a high dose of 300 ppm. Behavioral signs of hearing loss were observed in rats exposed to toluene subchronically at levels of 1000 ppm or more. IARC has rated Xylene as a class 3 carcinogen

COMPONENT TOXICITY: Ethylbenzene, a component of this product, has been designated by the International Agency for Research on Cancer as "possibly carcinogenic to humans", based on increased tumor incidence in laboratory animals. Overexposure may lead to nervous system effects, including drowsiness, dizziness, nausea, headaches, paralysis, loss of consciousness and even death. Repeated overexposure has caused a hearing loss in laboratory animals.

Xylene, all isomers
ACGIH (United States).
TWA: 100 ppm 8 hour(s).
STEL: 150 ppm 15 minute(s).
OSHA (United States).
TWA: 100 ppm 8 hour(s).

Ethylbenzene
ACGIH (United States).
TWA: 100 ppm 8 hour(s).
STEL: 125 ppm 15 minute(s).
OSHA (United States).
TWA: 100 ppm 8 hour(s).

Toluene
ACGIH (United States). Skin
TWA: 50 ppm 8 hour(s).
OSHA (United States).
TWA: 200 ppm 8 hour(s).
CEIL: 300 ppm
PEAK: 500 ppm

BENZENE CAS: 71-43-2 < 1.0%
0.5 ppm ACGIH TWA
2.5 ppm ACGIH STEL
1 ppm OSHA PEL
5 ppm OSHA CEILING
10 LBS CERCLA 302.4 RQ

	Butyl Acetate
Inhalation. LC50:	9.6->29.2 mg/kg – rats – 4 hrs
Oral LD50:	10700-14130 mg/kg – rats
Skin absorption LD50:	>17600 mg/kg - rabbits

Ethyl Acetate

Oral LD50: 5620 to 10170 mg/kg (rats); ethyl acetate is practically nontoxic to animals by ingestion.

Inhalation: LC50: 200 mg/l (rats, 1 hr.); Inhalation LC50: >29.3 mg/l (rats, 4 hrs.); ethyl acetate is practically nontoxic to animals by inhalation. Sedative effects (CNS depression typical of many solvents) have been observed in animals. Mild nose and throat irritation have been reported in humans at 400 ppm.

Skin: Ethyl acetate was not irritating to rabbit skin. There was no evidence of cumulative skin irritation in human tests. It was not a skin sensitizer in the guinea pig maximization test. Human patch testing and epicutaneous testing was in general negative. Practically nontoxic dermally to animals (Dermal LD50, rabbits: >5000 mg/kg).

Eye: Liquid mildly to moderately irritating to rabbit eyes in several tests. Vapors at 400 ppm have been reported to cause mild eye irritation in humans.

Repeated Exposure: Rats received 0, 300, 900, or 3600 mg/kg ethyl acetate daily by gavage for 90 days. The high dose male rats showed significantly depressed body and organ weights and depressed food consumption. The No-Observed-Adverse-Effect Level (NOAEL) was considered to be 900 mg/kg. Rats were exposed to 0, 350, 750, or 1500 ppm ethyl acetate vapor for 6 hours per day, 5 days per week, for 13 weeks. No mortality was observed. Observations noted in the 750 and 1500 ppm groups included diminished alerting response (due to the sedative properties of ethyl acetate) during the daily 6-hour exposure periods which reversed after exposure ended. Decreased body weight and food consumption were also noted. No persistent neurotoxic effects were observed in a battery of tests conducted to assess this endpoint during subchronic inhalation exposure. Microscopic examination of the tissues and organs did not reveal evidence of systemic toxicity at any dose level. The only microscopic finding was irritation of the nasal tissue (nasal olfactory mucosa) at all doses. At 350 ppm, the nasal irritation was graded as "minimal" in severity. Mutagenicity:

In Vitro: Results were equivocal. Ethyl acetate was negative in two Ames tests with Salmonella typhimurium and in a recombination assay with Bacillus subtilis. In the Sister Chromatid Exchange (SCE) assay with Chinese hamster ovary (CHO) cells, it was positive with activation and negative without activation. In five separate tests for aneuploidy with Saccharomyces cerevisiae, it was positive four times. It was negative for chromosomal aberrations in CHO cells, but positive in Chinese hamster lung fibroblasts.
In Vivo: Not Mutagenic: Ethyl acetate was negative in three separate micronucleus assays - mouse (i.p.), Chinese hamster (i.p.), and Chinese hamster (gavage).

Carcinogenicity: No studies conducted according to established scientific principles.

Reproductive/Developmental Effects: In the subchronic inhalation study previously discussed, there were no effects at any dose level on the number of spermatids in the testes, the number of sperm in the epididymides, sperm motility or sperm morphology. No other studies conducted according to established scientific principles were available.

Glycol Ether EB

Inhalation. LC50:	500 ppm – rats – 4 hrs.
Oral LD50:	2.4 g/kg – rats 320 mg/kg - rabbit
Dermal LD50:	400 mg/kg - rabbit

Glycol Ether EB major effect in acute and subchronic animal studies was intravascular red cell hemolysis. Secondary effects were spleen and liver enlargement and nephropathy. These studies

have not been shown relevant to humans. Effects on embryo/fetus were only evident in the presence of maternal toxicity. NTP reported testicular weight changes in rats and mice ingesting 6000 ppm on a 13 week drinking water study.

Methyl Isobutyl Ketone

Additional Remarks Prolonged chronic exposure may cause kidney damage.
Eyes :Irritating to eyes.
Skin: Acute dermal LD50 (rabbit): 16,000 mg/kg
Inhalation Acute 4 hours LC50 (rat): 2,000 mg/l
Ingestion Acute oral LD50(rat): 2,080 mg/kg
Assessment toxicity to reproduction: Passes through the placental barrier in humans.
CARCINOGENICITY: This product contains no carcinogenic substances.

ISOPROPANOL

LD/50
5000 MG/KG RAT ORAL
3600 MG/KG MOUSE ORAL
6410 MG/KG RABBIT ORAL
12,800 MG/KG RABBIT DERMAL

LC/50
53,000 MG/M3 MOUSE INHALATION
72,600 MG/M3 RAT INHALATION
16,000 PPM/8H RAT INHALATION

Methyl Ethyl Ketone

Inhalation. LC50:	>5000 ppm – rats – 6 hrs.
Oral LD50:	2.7-5.6 g/kg – rats
Skin absorption LD50:	5.0-13.0 g/kg - rabbits

MEK is not genotoxic, not carcinogenic, rats showed potential for fetal toxicity at levels >3000 ppm, but no teratogenetic effects.

1-methoxy –2-propanol

Oral LD50:	5,660 mg/kg rats
Inhalation LD50:	15000 ppm rats

1-Methoxy-2-propanol contains less than 0.5% of 2-Methoxy-1-propanol. 2-Methoxy-1-propanol has been shown to cause developmental effects in the offspring of female rabbits exposed to 0,145,225,350, and 545 ppm by inhalation during pregnancy. 2-Methoxy-1-propanol damages developing fetus

□□***1-Methoxy-2-propanol acetate 108-65-6***
Acute Toxicity - Lethal Doses
LD50 (Oral) Rat 8,532 MG/KG BWT
LD50 (Skin) Rat > 5,000 MG/KG
Target Organ Effects Eye. Skin.
Repeated Dose Toxicity No known chronic health effects.

□□***2-Methoxy-1-propanol acetate 70657-70-4 <0.5%***
Target Organ Effects Eye. Damages developing fetus.
Repeated Dose Toxicity
2-Methoxy-1-propanol has been shown to cause developmental effects in offspring of female rabbits exposed to 0, 145, 225, 350, and 545 ppm by inhalation during pregnancy. 145 ppm was the no observed effect level (NOEL) in this study. The acetate of 2-methoxy-1-propanol also has been tested for developmental effects. Information for the acetate is pertinent since the acetate

portion of this molecule is quickly removed in a living organism to yield 2-methoxy-1-propanol. The offspring of rats exposed to concentrations of 0, 110, 550, or 2,700 ppm developed vertebral incisions at the highest exposure level, in the presence of maternal toxicity. Rabbits exposed to 0, 36, 145, or 550 ppm of 2-methoxy-1-propanol acetate bore offspring that showed malformations of sternum, paws, major blood vessels and the heart at the highest exposure level. A concentration of 145 ppm was the no observed effect level (NOEL) for adverse developmental effects from the acetate of 2-methoxy-1-propanol.
Reproductive Effects Damages developing fetus.
Carcinogenicity Not listed by IARC, NTP, or OSHA.

N-BUTANOL

Eyes No data available
Skin Acute dermal LD50 (rabbit): 3,400 mg/kg
Inhalation Acute 4 hours LC50 (rat): 8 mg/l
Ingestion Acute oral LD50(rat): 750 mg/kg
CARCINOGENICITY This product contains no carcinogenic substances.

Methyl Acetate

Oral LD50: 6970 mg/kg (rats); practically nontoxic to animals.
Inhalation: LC50 (rat, 4 hr.) = >16000 ppm; practically nontoxic to animals. Potential for CNS depression (narcosis), respiratory tract irritation and visual disturbances if inhaled at high concentrations above established workplace exposure levels.
Skin: Slightly irritating to rabbit skin. Practically nontoxic to animals (LD50, rabbits >5000mg/kg). In a limited study with 25 human volunteers, not a sensitizer when dosed at 10% in petrolatum.
Eye: Strong irritant.
Mutagenicity: Not mutagenic in the Ames Test; induced abnormal number of chromosomes in yeast cells *in vitro* .
Based on assessment of the bone marrow from treated and control rats from the 4-week inhalation study using the micronucleus method, Methyl Acetate was not mutagenic in vivo.
Repeated Exposure: In an 8-day study of limited quality, cats exposed to 6600 ppm for 6 hrs./day showed weight loss, CNS depression, pulmonary irritation and reduced survival.

A 4-week inhalation study with methyl acetate vapor in male and female rats was conducted according to current scientific guidelines. Animals were exposed to 0, 75, 350 or 2000 ppm of Methyl Acetate for 6 hours per day, 5 days per week for 4 weeks. The LOEL (Lowest Observed Effect Level) for Methyl Acetate is 2000 ppm in air. The major effect was damage to the nasal tissues in 19 of 20 rats tested at 2000 ppm. More specifically, degeneration of the olfactory epithelial tissue of moderate severity was observed on microscopic examination of nasal tissues. The NOAEL (No Observed Adverse Effect Level) is 350 ppm. The NOEL (No Observed Effect Level) is 75 ppm. Systemic toxicity (i.e., toxicity to tissues distant from the site of vapor contact) was not evident at any concentration level. Based on blood analyses taken immediately on cessation of the 4-week exposure period, Methyl Acetate was not measurable in the blood. It is therefore rapidly metabolized and is not persistent.

12. Ecological Information

No Data Available.

13. Disposal Considerations

Dispose of spilled material in accordance with state and local regulations for waste that is non-hazardous by Federal definition. Note that this information applies to the material as manufactured; processing, use, or contamination may make this information inappropriate, inaccurate, or incomplete.
Note that this handling and disposal information may also apply to empty containers, liners and rinsate. State or local regulations or restrictions are complex and may differ from federal regulations. This information is intended as an aid to proper handling and disposal; the final responsibility for handling and disposal is with the owner of the waste.

14. Transport Information

UN1993, Flammable Liquids, N.O.S., (Methyl ethyl Ketone, Toluene), 3, PG II
NAERG #: 128

15. Regulatory Information

Environmental Regulations
SARA 311:

Acute health:	Yes	**Chronic health:**	Yes
Fire:	Yes	**Sudden release of pressure:**	No
Reactive:	No		

SARA 313: Title III of the 1986 Super fund Amendments and Reauthorization Act (SARA) and 40 CFR PART 372.

Ingredients	**CAS #**	**Ingredients**	**CAS #**
Methanol	67-56-1	Acetone	67-64-1
Toluene	108-88-3	Methyl Ethyl Ketone	78-93-3
Methyl Isobutyl Ketone	108-10-1	Xylene	1330-20-7
2-Butoxy Ethanol	111-76-2	Ethyl Benzene	100-41-4
Aromatic Petroleum Distillates**	64742-95-6		

**Aromatic Distillates may contains 7% Xylene (1330-20-7), 3% cumene (98-82-8), 20% 1,2,4 Trimethylbenzene (95-63-6) which are subject to the reporting requirements of SARA 313.
NOTE: This is a recycled product. The ingredients and their amounts may change from batch to batch.

All the chemicals used in this product are TSCA listed.

Check

16. Other Information

Hazard ratings This information is intended solely for the use of individuals trained in the NFPA and/or HMIS systems.

NFPA: Health: 2 Flammability: 3 Reactivity: 0

HMIS: Health: *2 Flammability: 3 Reactivity: 0
RATING: 4-EXTREME 3-HIGH 2-MODERATE 1-SLIGHT 0-INSIGNIFICANT

Note:
For industrial use only. The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. Chemical Solvents Inc makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. Effects can be aggravated by other materials and/or this material may aggravate or add to the effects of other materials. This material may be released from gas, liquid, or solid materials made directly or indirectly from it. User has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards. Possession of an MSDS does not indicate that the possessor of the MSDS was a purchaser or user of the subject product.

Revision Date: 1/15/2020

Attachment 6

RACT Search

COMPREHENSIVE REPORT
Report Date:02/17/2024

Facility Information

RBLC ID:	IN-0348 (final)	**Date Determination Last Updated:**	08/16/2022
Corporate/Company Name:	PPG INDUSTRIES, INC.	**Permit Number:**	021-45156-00061
Facility Name:	PPG INDUSTRIES, INC.	**Permit Date:**	05/06/2022 (actual)
Facility Contact:	JASON NOWAK (248) 408-8354	**FRS Number:**	110040629291
Facility Description:		**SIC Code:**	2851
Permit Type:	C: Modify process at existing facility	**NAICS Code:**	325510
Permit URL:	https://permits.air.idem.in.gov/45156f.pdf		
EPA Region:	5	**COUNTRY:**	USA
Facility County:	CLAY		
Facility State:	IN		
Facility ZIP Code:	47834		
Permit Issued By:	INDIANA DEPT OF ENV MGMT, OFC OF AIR (Agency Name) MR. MATT STUCKEY(Agency Contact) (317) 233-0203 mstuckey@idem.in.gov		
Permit Notes:	BACT was reopened to add Tank washing unit.		

Facility-wide Emissions:

Pollutant Name:	Facility-wide Emissions Increase:
Carbon Monoxide	1.1100 (Tons/Year)
Nitrogen Oxides (NOx)	2.5300 (Tons/Year)
Particulate Matter (PM)	156.8000 (Tons/Year)
Sulfur Oxides (SOx)	0.0100 (Tons/Year)
Volatile Organic Compounds (VOC)	99.1300 (Tons/Year)

Process/Pollutant Information

PROCESS NAME:	Large, small, and bulk batch lines, spray fill line, big blue, tank washing unit
Process Type:	49.009 (Paint/Coating/Adhesives Manufacturing)
Primary Fuel:	
Throughput:	0
Process Notes:	

POLLUTANT NAME:	Volatile Organic Compounds (VOC)
CAS Number:	VOC
Test Method:	Unspecified
Pollutant Group(s):	(Volatile Organic Compounds (VOC))
Emission Limit 1:	0.0004 LB VOC/ LB VOC USED
Emission Limit 2:	0.0200 LB VOC/ LB VOC USED
Standard Emission:	

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis:	OTHER CASE-BY-CASE
Other Applicable Requirements:	
Control Method:	(A) Thermal oxidizer (RTO)
Est. % Efficiency:	98.000
Cost Effectiveness:	0 $/ton
Incremental Cost Effectiveness:	0 $/ton
Compliance Verified:	Unknown
Pollutant/Compliance Notes:	The VOC emissions from the Large Batch Line, Small Batch Line, Bulk Batch Line, Spray Fill Line, Tank Washing Unit, and Big Blue emission units shall be controlled by a thermal oxidizer. The overall control efficiency, including capture and destruction efficiency, shall be at least 98%. The emissions from the Large Batch Line, Small Batch Line, Bulk Batch Line, Spray Fill Line, and Big Blue emission units shall not exceed 0.0004 pound of VOC per pound of VOC used. The emissions from the Tank Washing Unit shall not exceed 0.02 pound of VOC per pound of VOC used.

Facility Information

RBLC ID:	IN-0322 (final)	**Date Determination Last Updated:**	05/26/2021
Corporate/Company Name:	PPG INDUSTRIES, INC.	**Permit Number:**	021-42620-00061
Facility Name:	PPG INDUSTRIES, INC.	**Permit Date:**	07/02/2020 (actual)
Facility Contact:	JUSTIN HADDON 812-442-5080	**FRS Number:**	Not Found
Facility Description:	Industrial Coatings Manufacturing facility	**SIC Code:**	2851
Permit Type:	C: Modify process at existing facility	**NAICS Code:**	325510
Permit URL:	https://permits.air.idem.in.gov/42620f.pdf		
EPA Region:	5	**COUNTRY:**	USA
Facility County:	CLAY		
Facility State:	IN		

Facility ZIP Code: 47834

Permit Issued By: INDIANA DEPT OF ENV MGMT, OFC OF AIR (Agency Name)
MR. MATT STUCKEY(Agency Contact) (317) 233-0203 mstuckey@idem.in.gov

Other Agency Contact Info: Permit Writer: Tamara Havics 317-232-8219 THavics@IDEM.IN.GOV
Section Chief: Ghassan Shalabi 317-233-7622 GShalabi@IDEM.IN.GOV

Permit Notes:

Facility-wide Emissions:

Pollutant Name:	Facility-wide Emissions Increase:
Carbon Monoxide	0.8700 (Tons/Year)
Nitrogen Oxides (NOx)	1.0300 (Tons/Year)
Particulate Matter (PM)	44.7800 (Tons/Year)
Sulfur Oxides (SOx)	0.0100 (Tons/Year)
Volatile Organic Compounds (VOC)	393.9500 (Tons/Year)

Process/Pollutant Information

PROCESS NAME: Large, small, and bulk batch lines, spray fill line, big blue

Process Type: 49.009 (Paint/Coating/Adhesives Manufacturing)

Primary Fuel:

Throughput: 0

Process Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 98.0000 % OVERALL CONTROL

Emission Limit 2: 0.0004 LB / LB OF VOC USED

Standard Emission:

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: OTHER CASE-BY-CASE

Other Applicable Requirements:

Control Method: (A) thermal oxidizer

Est. % Efficiency: 98.000

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes: State BACT

Facility Information

RBLC ID:	WV-0030 (final)	**Date Determination Last Updated:**	02/20/2019
Corporate/Company Name:	ROXUL USA, INC.	**Permit Number:**	R14-0037
Facility Name:	RAN FACILITY	**Permit Date:**	04/30/2018 (actual)
Facility Contact:	METTE DREJSTEL 9999999999 METTE.DREJSTEL@ROCKWOOL.COM	**FRS Number:**	Not Found
Facility Description:	Mineral wool manufacturing facility. Only the larger emission sources placed in the RBLC. See permit for individual BACT on many smaller n/g fired units, material handling emission sources, fugitive, emission sources, etc.	**SIC Code:**	3296
Permit Type:	A: New/Greenfield Facility	**NAICS Code:**	327993
Permit URL:	https://dep.wv.gov/daq/Documents/April 2018 Permits and Evals/037-00108_PERM_R14-0037.pdf		
EPA Region:	3	**COUNTRY:**	USA
Facility County:	JEFFERSON		
Facility State:	WV		
Facility ZIP Code:	25340		
Permit Issued By:	WEST VIRGINIA DEPT. OF ENVRIONMENTAL PROTECTION; DIV. OF AIR QUALITY (Agency Name) MR. JOE KESSLER, PE(Agency Contact) (304)926-0499X1219 Joseph.r.kessler@wv.gov		
Other Agency Contact Info:	Permit Engineer: Joe Kessler, PE West Virginia Division of Air Quality 601-57th St., SE Charleston, WV 25304 Phone: (304) 926-0499 x1219 Joseph.r.kessler@wv.gov		
Permit Notes:			

Affected Boundaries:

Boundary Type:	Class 1 Area State:	Boundary:	Distance:
CLASS1	WV	Dolly Sods	100km - 50km
CLASS1	VA	James River Face	100km - 50km
CLASS1	WV	Otter Creek	100km - 50km
CLASS1	VA	Shenandoah NP	< 100 km

Facility-wide **Pollutant Name:** **Facility-wide Emissions Increase:**

Emissions:		
	Carbon Monoxide	71.4000 (Tons/Year)
	Nitrogen Oxides (NOx)	238.9600 (Tons/Year)
	Particulate Matter (PM)	250.8700 (Tons/Year)
	Sulfur Oxides (SOx)	147.4500 (Tons/Year)
	Volatile Organic Compounds (VOC)	471.4100 (Tons/Year)

Process/Pollutant Information

PROCESS NAME: Melting Furnace

Process Type: 90.022 (Mineral Wool Manufacturing)

Primary Fuel: coal

Throughput: 0

Process Notes: Melting furnace uses natural gas to warm up baghouses to prevent condensation. Once to temperature, coal is primary fuel. Pet coke may be used in lieu of coal if coal not available. Single emission limit regardless of fuel burned. Throughput is claimed confidential.

POLLUTANT NAME: Nitrogen Oxides (NOx)

CAS Number: 10102

Test Method: Unspecified

Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))

Emission Limit 1: 37.3700 LB/HR 30-DAY ROLLING

Emission Limit 2: 163.6700 TONS/YEAR 12-MONTH ROLLING

Standard Emission: 37.3700 LB/HR 30-DAY ROLLING

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: N/A

Control Method: (B) Integrated SNCR, Oxy-Fired Burners

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes: Will utilize NOx CEMs.

POLLUTANT NAME: Particulate matter, total < 2.5 μ (TPM2.5)

CAS Number: PM

Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 7.4700 LB/HR
Emission Limit 2: 32.7300 TONS/YEAR
Standard Emission: 7.4700 LB/HR
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) Baghouse
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total < 10 μ (TPM10)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 8.2200 LB/HR
Emission Limit 2: 36.0100 TONS/YEAR
Standard Emission: 8.2200 LB/HR
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) Baghouse
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable (FPM)
CAS Number: PM

Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 2.3200 LB/HR
Emission Limit 2: 10.1500 TONS/YEAR
Standard Emission: 0.0130 GR/DSCF
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: MACT , SIP
Control Method: (A) Baghouse
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes: Also subject to 0.10 lb-PM/ton Melt 40 CFR 63, Subpart DDD limit.

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 33.6300 LB/HR 30-DAY ROLLING
Emission Limit 2: 147.3100 TONS/YEAR 12-MONTH ROLLING
Standard Emission: 33.6300 LB/HR 30-DAY ROLLING
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) Sorbent Injection in Baghouse
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC

Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 11.6600 LB/HR
Emission Limit 2: 51.0800 TONS/YEAR
Standard Emission: 11.6600 LB/HR
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (P) Good Combustion Practices
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Dioxide Equivalent (CO2e)
CAS Number: CO2e
Test Method: Unspecified
Pollutant Group(s): (Greenhouse Gasses (GHG))
Emission Limit 1: 95547.0000 TON/YEAR 12-MONTH ROLLING
Emission Limit 2:
Standard Emission: 95547.0000 TON/YEAR 12-MONTH ROLLING
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (P) Various Energy Efficiency Procedures.
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfuric Acid (mist, vapors, etc)
CAS Number: 7664-93-9

Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Particulate Matter (PM))
Emission Limit 1: 3.7400 LB/HR
Emission Limit 2: 16.3700 TONS/YEAR
Standard Emission: 3.7400 LB/HR
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: SIP
Control Method: (A) Sorbent Injection in the Baghouse
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: Coal Mill Burner and Fluidized Bed Burner
Process Type: 90.011 (Coal Handling/Processing/Preparation/Cleaning)
Primary Fuel: Natural Gas
Throughput: 6.00 mmBtu/hr
Process Notes: Combined vertical coal mill and fluidized bed dryer equipped with a 6.00 mmBtu/hr natural gas-fired direct heating unit. The combined exhaust from the dryer heater and the mill will be controlled by a baghouse and exhausted from a stack.

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 0.4200 LB/HR
Emission Limit 2: 1.8600 TONS/YEAR
Standard Emission: 60.0000 PPM @ 3% O2
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A

Control Method: (P) LNB and Temperature Control (Drying in the Fluidized Bed Dryer shall take place at a temperature of less than 180 degrees Fahrenheit so as to prevent any combustion of the coal)

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total < 2.5 μ (TPM2.5)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.2600 LB/HR

Emission Limit 2: 1.0600 TONS/YEAR

Standard Emission: 0.2600 LB/HR

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: N/A

Control Method: (A) Baghouse

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total < 10 μ (TPM10)

CAS Number: PM

Test Method: Unspecified

Pollutant Group(s): (Particulate Matter (PM))

Emission Limit 1: 0.3200 LB/HR

Emission Limit 2: 1.3300 TONS/YEAR

Standard Emission: 0.3200 LB/HR

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: N/A
Control Method: (A) Baghouse
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable (FPM)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.1200 LB/HR
Emission Limit 2: 0.5400 TONS/YEAR
Standard Emission: 0.0050 GR/DSCF
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: SIP , N/A
Control Method: (A) Baghouse
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)
CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.0035 LB/HR
Emission Limit 2: 0.0200 TONS/YEAR
Standard Emission: 0.0035 LB/HR
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: N/A
Control Method: (P) Use of Natural Gas
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 0.4100 LB/HR
Emission Limit 2: 1.6500 TONS/YEAR
Standard Emission: 0.4100 LB/HR
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (P) Good Combustion Practices
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Carbon Dioxide Equivalent (CO2e)
CAS Number: CO2e
Test Method: Unspecified
Pollutant Group(s): (Greenhouse Gasses (GHG))
Emission Limit 1:
Emission Limit 2:
Standard Emission: 3080.0000 TON/YEAR 12-MONTH ROLLING
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: N/A
Control Method: (P) Use of Natural Gas, Good Combustion Practices
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: Gutter Exhaust, Spinning Chamber, Curing Oven Hoods, Curing Oven, and Cooling Section
Process Type: 90.022 (Mineral Wool Manufacturing)
Primary Fuel:
Throughput: 0
Process Notes: Throughout is claimed confidential. Curing Oven controlled by afterburner prior to control in the Wet Electrostatic Precipitator (WESP). All other sources controlled by WESP.

POLLUTANT NAME: Nitrogen Oxides (NOx)
CAS Number: 10102
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
Emission Limit 1: 14.5500 LB/HR
Emission Limit 2: 63.7300 TONS/YEAR
Standard Emission: 14.5500 LB/HR
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (P) LNB, Good Combustion Practice
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes: NOx emissions from both the Afterburner exhaust and two n/g heaters in the Curing Oven (size claimed confidential).

POLLUTANT NAME: Particulate matter, total < 2.5 μ (TPM2.5)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 19.2200 LB/HR
Emission Limit 2: 84.2000 TONS/YEAR
Standard Emission: 19.2200 LB/HR
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) Wet Electrostatic Precipitator
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total < 10 μ (TPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 21.2100 LB/HR
Emission Limit 2: 92.8900 TONS/YEAR
Standard Emission: 21.2100 LB/HR
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (A) Wet Electrostatic Precipitator
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable (FPM)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 21.2100 LB/HR
Emission Limit 2: 92.8900 TONS/YEAR
Standard Emission: 21.2100 LB/HR
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: SIP
Control Method: (A) Wet Electrostatic Precipitator
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Sulfur Dioxide (SO2)

CAS Number: 7446-09-5
Test Method: Unspecified
Pollutant Group(s): (InOrganic Compounds , Oxides of Sulfur (SOx))
Emission Limit 1: 0.0100
Emission Limit 2: 0.0500
Standard Emission: 0.0100
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: N/A
Control Method: (P) Use of Natural Gas
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown

Pollutant/Compliance Notes: SO2 emissions from both the Afterburner exhaust and two n/g heaters in the Curing Oven (size claimed confidential).

POLLUTANT NAME: Volatile Organic Compounds (VOC)

CAS Number: VOC

Test Method: Unspecified

Pollutant Group(s): (Volatile Organic Compounds (VOC))

Emission Limit 1: 78.0200 LB/HR

Emission Limit 2: 341.7100 TONS/YEAR

Standard Emission: 78.0200 LB/HR

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: N/A

Control Method: (B) Afterburner Good Combustion Practices Subpart DDD Compliance

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes: Majority of VOCs come from organics driven off of binder used in the mineral wool production process. Those driven off in curing oven are destroyed in the afterburner, others go through the WESP uncontrolled prior to emission. Subpart DDD limits are for organic HAPs.

POLLUTANT NAME: Carbon Dioxide Equivalent (CO2e)

CAS Number: CO2e

Test Method: Unspecified

Pollutant Group(s): (Greenhouse Gasses (GHG))

Emission Limit 1: 35644.0000 TON/YEAR

Emission Limit 2:

Standard Emission: 35644.0000 TON/YEAR 12-MONTH ROLLING

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: N/A

Control Method: (P) Use of Natural Gas Good Combustion Practices

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes: CO2e emissions from both the Afterburner exhaust and two n/g heaters in the Curing Oven (size claimed confidential).

Process/Pollutant Information

PROCESS NAME: Fleece Application
Process Type: 90.022 (Mineral Wool Manufacturing)
Primary Fuel:
Throughput: 0
Process Notes: Throughput is claimed confidential.

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 7.1400 TONS/MONTH
Emission Limit 2: 0.0160 LB-VOC/LB-COATING
Standard Emission: 28.5800 TON/YEAR 12-MONTH ROLLING
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: MACT
Control Method: (P) Low-VOC Coatings, Good Work Practices
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: Spray Paint Cabin
Process Type: 49.009 (Paint/Coating/Adhesives Manufacturing)

Primary Fuel:

Throughput: 0

Process Notes: Spray Paint Cabin for Rockfon Tile Manufacturing. Throughput is claimed confidential.

POLLUTANT NAME: Particulate matter, total < 2.5 μ (TPM2.5)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.6600 LB/HR
Emission Limit 2: 2.9000 TONS/YEAR
Standard Emission: 0.6600 LB/HR
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) Fabric Filter
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, total < 10 μ (TPM10)

CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.8800 LB/HR
Emission Limit 2: 3.8600 TONS/YEAR
Standard Emission: 0.8800 LB/HR
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements:
Control Method: (A) Fabric Filter
Est. % Efficiency:
Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

POLLUTANT NAME: Particulate matter, filterable (FPM)
CAS Number: PM
Test Method: Unspecified
Pollutant Group(s): (Particulate Matter (PM))
Emission Limit 1: 0.4400 LB/HR
Emission Limit 2: 1.9300 TONS/YEAR
Standard Emission: 0.0081 GR/DSCF
Did factors, other then air pollution technology considerations influence the BACT decisions: U
Case-by-Case Basis: BACT-PSD
Other Applicable Requirements: SIP
Control Method: (A) Fabric Filter
Est. % Efficiency:
Cost Effectiveness: 0 $/ton
Incremental Cost Effectiveness: 0 $/ton
Compliance Verified: Unknown
Pollutant/Compliance Notes:

Process/Pollutant Information

PROCESS NAME: Rockfon Glue and Paint Application
Process Type: 41.999 (Other Surface Coating/Printing/Graphic Arts Sources)
Primary Fuel:
Throughput: 0
Process Notes: Application of Glue and Paint in the Rockfon ceiling tile line. Throughput is claimed confidential.

POLLUTANT NAME: Volatile Organic Compounds (VOC)
CAS Number: VOC
Test Method: Unspecified
Pollutant Group(s): (Volatile Organic Compounds (VOC))
Emission Limit 1: 8.9800 TONS/MONTH

Emission Limit 2:

Standard Emission: 35.9300 TON/YEAR

Did factors, other then air pollution technology considerations influence the BACT decisions: U

Case-by-Case Basis: BACT-PSD

Other Applicable Requirements: N/A

Control Method: (P) Low-VOC materials and the utilization of Good Work Practices

Est. % Efficiency:

Cost Effectiveness: 0 $/ton

Incremental Cost Effectiveness: 0 $/ton

Compliance Verified: Unknown

Pollutant/Compliance Notes:

Attachment 7

Thermal Oxidizer Expenses

Thermal oxidizer quote is confidential.

Data Inputs

Select the type of oxidizer: Regenerative Thermal Oxidizer

Enter the following information for your emission source:

Composition of Inlet Gas Stream

Pollutant Name	Concentration (ppmv)	Lower Explosive Limit (LEL) (ppmv)*	Heat of Combustion (Btu/scf)	Molecular Weight
Toluene (highest VOC)	0.46	11,000	4,274	92

Note: The lower explosion limit (LEL), heat of combustion and molecular weight for some commonly used VOC/HAP are provided in the table below. In addition, the heat of combustion to be entered in column D is a lower heating value (LHV), not a higher heating value (HHV).

VOC use (lbs)-VOC emissions/0.015	4426667
Paint produced (gals)	1155827
lb VOC/gallon Paint	3.83
lbs/gal to ppm	458935 (multiply lbs/gal*119830.45)
PPM to PPMV	0.458935 divide ppm by 1,000,000

Use information from 2021 as that was highest paint production year

Enter the design data for the proposed oxidizer:

Number of operating hours/year	2,080	hours/year	
Inlet volumetric flow rate(Q_{in}) at 77°F and 1 atm.	20,000	scfm*	* 20,000 scfm is a default volumetric flow rate. User should enter actual value, if known.
Pressure drop (ΔP)	19	inches of water	* 19 inches of water is a default pressure drop for thermal oxidizers. User should enter actual value, if known.
Motor/Fan Efficiency (ε)	60	percent*	* 60% is a default fan efficiency. User should enter actual value, if known.
Inlet Waste Gas Temperature (T_{wi})	85	°F	
Operating Temperature (T_{fi})	2,000	°F*	* Note: Default value for Tfi is 2000°F for thermal regenerative oxidizers. Use actual value if known. Tfi for regenerative oxidizers typically between 1800 and 2000°F.
Destruction and Removal Efficiency (DRE)	98	percent	
Estimated Equipment Life	20	Years*	* 20 years is the typical equipment life. User should enter actual value, if known.
Heat Loss (η)	1	percent*	* 1 percent is a default value for the heat loss. User should enter actual value, if known. Heat loss is typically between 0.2 and 1.5%.

Percent Energy Recovery (HR) = 70 percent

Enter the cost data:

Desired dollar-year	2021			
CEPCI* for 2021	708	Enter the CEPCI value for 536.4	2016 CEPCI	*Enter dollar year first.
Annual Interest Rate (i)	5.50	%		* The default rate of 5.50% is the current bank prime rate, which is a nominal (or market) G4Sinterest rate.
Electricity ($Cost_{elect}$)	0.0641	$/kWh		* $0.0641/kWh is a default price for electicity. User should enter actual value, if known.
Natural Gas Fuel Cost ($Cost_{fuel}$)	0.00351	$/scf		* $0.00351/scf is a default price for natural gas. User should enter actual value, if known.
Operator Labor Rate	$26.61	per hour		* $26.61 per hour is a default labor rate. User should enter actual value, if known.
Maintenance Labor rate	$27.40	per hour		* $27.40 per hour is a default labor rate. User should enter actual value, if known.
Contingency Factor (CF)	10.0	Percent		* 10 percent of the total capital investment F4Sis a default value for construction contingencies. User may enter values between 5 and 15 percent.

* CEPCI is the Chemical Engineering Plant Cost Escalation/De-escalation Index. The use of CEPCI in this spreadsheet is not an endorsement of the index for purposes of cost escalation or de-escalation, but is there merely to allow for availability of a well-known cost index to spreadsheet users. Use of other well-known cost indexes (e.g., M&S) is acceptable.

Data Sources for Default Values Used in Calculations:

Parameters for Common Compounds:

Compound	LEL (ppmv)	Heat of Combustion (Btu/scf)	Molecular Weight
Methane*	50,000	911	16.04
Ethane	30,000	1,631	30.07
Propane	21,000	2,353	44.09
Butane	19,000	3,101	58.12
Pentane	14,000	3,709	72.15
Hexane	11,000	4,404	86.17
Octane	10,000	5,796	114.23
Nonane	8,000	6,493	128.25
Decane	8,000	7,190	142.28
Ethylene**	27,000	1,499	28.05
Propylene	20,000	2,182	42.08
Cyclohexane	13,000	4,180	84.16
Benzene**	14,000	3,475	78.11
Toluene**	11,000	4,274	92.14
Methyl Chloride (Chloromethane)**	82,500	705	50.49

Footnotes
* Greenhouse gas.
** Hazardous air pollutant.

Data Element	Default Value	Sources for Default Values used in the calculation . . .	If you used your own site-specific values, please enter the value used and the reference source . . .	Recommended data sources for site-specific information
Electricity Cost ($/kWh)	0.0641	Average annual electricity cost for industrial plants is based on 2016 price data compiled by the U.S. Energy Information Administration from data reported on Form EIA-861 and 8615, (https://www.eia.gov/electricity/annual/html/epa_02_04.html).		Plant's utility bill or use U.S. Energy Information Administration (EIA) data for most recent year. Available at http://www.eia.gov/electricity/data.cfm#sales.
Fuel Cost ($/Mscf)	3.51	Annual average price paid for natural gas by industrial facilities in 2016 from the U.S. Energy Information Administration. Available at http://www.eia.gov/dnav/ng/hist/n3035us3A.htm.		Check with fuel supplier or use U.S. Energy Information Administration (EIA) data for most recent year." Available at http://www.eia.gov/dnav/ng/hist/n3035us3A.htm.
Operator Labor ($/hour)	26.61	Bureau of Labor Statistics, May 2016 National Occupational Employment and Wage Estimates – United States, May 2016 (https://www.bls.gov/oes/current/oes_nat.htm). Hourly rates for operators based on data for plant and System Operators – other (51-8099).		Use plant-specific labor rate.
Maintenance Labor ($/hour)	27.40	Bureau of Labor Statistics, May 2016 National Occupational Employment and Wage Estimates – United States, May 2016 (https://www.bls.gov/oes/current/oes_nat.htm). Hourly rates for maintenance workers based on electrical and electronics commercial and industrial equipment repairers (49-2094).		Use plant-specific labor rate.

Cost Estimate

Direct Costs

Total Purchased equipment costs (in 2021 dollars)

Incinerator + auxiliary equipment[a] (A) =		
Equipment Costs (EC) for Regenerative Oxidizer	=(2.204 x 100,000 + 11.57 Qtot) x (2021 CEPI/1999 CEPCI) =	$721,439 in 2021 dollars
Instrumentation[b] =	0.10 × A =	$72,144
Sales taxes =	0.03 × A =	$21,643
Freight =	0.05 × A =	$36,072
	Total Purchased equipment costs (B) =	$851,297 in 2021 dollars

Footnotes
a - Auxiliary equipment includes equipment (e.g., duct work) normally not included with unit furnished by incinerator vendor.
b - Includes the instrumentation and controls furnished by the incinerator vendor.

Direct Installation Costs (in 2021 dollars)

Foundations and Supports =	0.08 × B =	$68,104
Handling and Erection =	0.14 × B =	$119,182
Electrical =	0.04 × B =	$34,052
Piping =	0.02 × B =	$17,026
Insulation for Ductwork =	0.01 × B =	$8,513
Painting =	0.01 × B =	$8,513
Site Preparation (SP) =		$0
Buildings (Bldg) =		$0
	Total Direct Installaton Costs =	$255,389
Total Direct Costs (DC) =	B + C + SP + Bldg =	$1,106,687 in 2021 dollars

Total Indirect Installation Costs (in 2021 dollars)

Engineering =	0.10 × B =	$85,130
Construction and field expenses =	0.05 × B =	$42,565
Contractor fees =	0.10 × B =	$85,130
Start-up =	0.02 × B =	$17,026
Performance test =	0.01 × B =	$8,513
	Total Indirect Costs (IC) =	$238,363
Continency Cost (C) =	CF(IC+DC)=	$134,505
Total Capital Investment =	**DC + IC +C =**	**$1,479,555 in 2021 dollars**

Direct Annual Costs

Annual Electricity Cost	= Annual Electricity Usage × Operating Hours/year × Electricity Price =	$9,880
Annual Fuel Costs for Natural Gas	= $Cost_{fuel}$ × Fuel Usage Rate × 60 min/hr × Operating hours/year	$18,218
Operating Labor	Operator = 0.5hours/shift × Labor Rate × (Operating hours/8 hours/shift)	$3,459
	Supervisor = 15% of Operator	$519
Maintenance Costs	Labor = 0.5 hours/shift × Labor Rate × (Operating Hours/8 hours/shift)	$3,562
	Materials = 100% of maintenance labor	$3,562
Direct Annual Costs (DC) =		**$39,199 in 2021 dollars**

Indirect Annual Costs

Overhead	= 60% of sum of operating, supervisor, maintenance labor and maintenance materials	$6,661
Administrative Charges	= 2% of TCI	$29,591
Property Taxes	= 1% of TCI	$14,796
Insurance	= 1% of TCI	$14,796
Capital Recovery	= CRF[TCI-1.08(cat. Cost)]	$123,808
Indirect Annual Costs (IC) =		**$189,652 in 2021 dollars**
Total Annual Cost =	**DC + IC =**	**$228,851 in 2021 dollars**

Cost Effectiveness

Cost Effectiveness = (Total Annual Cost)/(Annual Quantity of VOC/HAP Pollutants Destroyed)

Total Annual Cost (TAC) =	$228,851 per year in 2021 dollars
VOC/HAP Pollutants Destroyed =	0.0 tons/year
Cost Effectiveness =	$83,802,768 per ton of pollutants removed in 2021 dollars